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Reinventing Government

DRAFT

Applying Economics to Natural Resource Management

MARCH 3, 1849

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 82003

1000 (910)

January 3, 1994

Memorandum

To: Director (100), Room 5660, MIB

From: Associate State Director, Wyoming

Subject: Economics Capability of the BLM

In compliance with a request from the Deputy Director dated October 4, 1993, the economic analysis team submits this report on the economics capability of the BLM. The team would like to acknowledge the cooperation of an impressive cadre of economists that provided input to the report and the contributions of the staff members at the Wyoming State Office.

The study represents the first time an assessment of this kind has been undertaken by the Bureau. While the report speaks to the total integration of economics into the Bureau's decision making process, it focuses specifically on the application of economics to ecosystem management.

Economics may well be the cornerstone to the successful realization of the Secretary's stated goal of a "new American land ethic" that is ecologically responsive and socially responsible. As we begin to establish and maintain self-sustaining natural systems through ecosystem management, economics must play a vital role.

The findings of the study indicate that in the past there has been a general lack of management support for the use of economics in management decisions. Economists have simply not been recognized as major players in the process.

It is the study team's firm recommendation that you begin immediately to implement the recommendations of this report. The very first action would be to appoint an economics advisor to your immediate staff to give high level management support to a critical component of the decision making process.

The study team appreciates the opportunity to prepare the report and thanks management and all others throughout the Bureau who contributed to its completion.

William E. [illegible]

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ID:88079042

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"REINVENTING GOVERNMENT: APPLYING ECONOMICS TO NATURAL RESOURCE MANAGEMENT UNDER THE ECOSYSTEM/ECOREGION MANAGEMENT CONCEPT"

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Released
January 1994

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EXECUTIVE SUMMARY

This study was chartered to assess the economics capability of the BLM. Bill Eikenberry, Associate State Director, Wyoming was appointed as team leader with assistance from Dan Sokoloski, Deputy Assistant Director, Energy & Minerals in the Washington Office, and Larry Bembry, Director, Denver Service Center.

The study was assigned a 60 to 90 day time frame. Assessing BLM's economics capability within this specified time frame required a very intensive effort. To accomplish this effort, a study team was established which reviewed numerous documents and queried managers and staff economists to ascertain their views and thoughts regarding BLM's economics capability and the most effective placement of the Bureau's economics staff. The team determined from this study that while the BLM has a well trained, diverse, and dedicated economics staff, much needs to be done to integrate them into the mainstream of BLM's decision making process and to prepare the agency for the integration of economics into ecosystem management. The Bureau's need for diversity should be a primary and on-going consideration that is reflected in any changes that occur in the Bureau's organization or staff.

Historically, Bureau economists have supported resource management planning efforts, with a majority of them employed in minerals evaluation and management. In their support of management, economists, traditionally, have focused on the quantitative aspects of public resources, and have assessed resource values in such units as dollars, AUM's, board feet, recreation days, acre feet, etc. However, if ecosystem management is to be successful, the Bureau must also determine what constitutes healthy ecosystems and how both the physical and intrinsic properties of the various resources contribute to the health and total potential of such ecosystems. Once the natural resource specialists have established these resource/ecosystem relationships, the economist can help the Bureau to determine the comparative monetary and qualitative tradeoffs between maintaining healthy versus unhealthy ecosystems. The economist can measure these tradeoffs in terms of the benefits and costs that can accrue to individuals and the economy, depending upon how ecosystems are maintained.

PLACEMENT OF BLM's ECONOMICS STAFF

Currently, BLM's economists are unevenly distributed throughout the Bureau, with the heaviest concentrations of GS-0110 economists occurring in states where the BLM minerals activities are the greatest. The minerals function within the BLM accounts for 13 out of the Bureau's twenty-two GS-0110 employees. Another six of the 22 are in planning and environmental assessment functions. The rest are employed in budget and other Bureau functions. Most of the Bureau's GS-0110 economists are also concentrated at the GS-12 grade level with little or no opportunities for advancement beyond this level unless they move out of the GS-0110 series and into management or some other specialty.

Those contacted for this report were asked to provide their opinions on 6 specific staffing alternatives and on any others they could offer to improve the Bureau's economics capability. Their responses are outlined below.

1. Placement at the local level--Most respondents favor placing economists as close as possible to the primary area of management actions so that economics can be integrated into management processes as early as possible. However, there is concern among many respondents that any

placement below the State Office level might prevent economists from maintaining necessary contacts with Bureau and other professionals, or retaining their professional skills.

2. Placement at the State Office level--this idea is unanimously supported by respondents, either as a stand alone idea or in combination with other site locations.

3. Placement at the Denver Service Center--roughly 30% of economists polled on this issue have no opinions on this option. However, it is favored 2 to 1 by those who did express an opinion. Those in favor believe that economists at the DSC could assist field offices with acquiring and applying analytical methods, economics models, and price files needed for resource and trade-offs evaluations. The DSC could also perform economic analyses and research for the field staffs when such staffs are too busy to take on such tasks themselves. This would be especially helpful for large or specialized projects. In effect, these respondents favor DSC placement only if the economists there are user friendly. Those against the idea feel that economists at the DSC would be isolated from actual problems and, like past support efforts at the DSC this, too, would fail. However, it should be noted that the current DSC Director is committed to making the Center an integrated part of BLM's over all mission, including the ecosystem management process.

4. Placement in the Washington Office--the majority of respondents favor locating some economists in the WO, but not to the exclusion of local level staffing. Their reasoning is that a Washington based economist(s) is close to national issues and the Congress, can help to assure adequate funding for the economics function throughout the BLM, provide high level coordination with other government agencies, and supply technical advice and guidance to the field offices.

5. Utilizing the economic expertise of contractors--the majority of those questioned favor utilizing the economic expertise of universities for developing models, databases, and conducting specific research projects. Those who are not positive on this idea think that the results of such support tend to be institutionalized, and that economists are required, anyway, to oversee the contracting process.

6. Establishing a specialized economics staff with solicitor type authority--many of those polled did not express an opinion on this item, but of the economists who replied, two to one oppose it. Those opposing it feel that economics has to be integrated into the normal work flow of field level management and that such a specialized type of economics staff would not fit well into the team approach to ecosystem/ecoregion management.

7. Other suggestions on staffing, or other methods of increasing BLM's economic expertise--there were five additional alternatives recommended by those questioned:

   a. Form a socio-economics council to review present, and to plan future, economic endeavors;

   b. Use the Phoenix Training Center to provide training in economics and ecosystem management;

   c. Place an economics staff under the Assistant Secretary to hatch out ideas on economics and provide the tools needed for economic analysis.

d. Use the Intergovernmental Personnel Act (IPA) exchange program with the states and local governments to obtain needed economics personnel.

RECOMMENDED ACTIONS TO IMPROVE ECONOMICS CAPABILITY

This study shows that there are many economists in BLM with training and/or experience in natural resource and/or regional economics. Natural resource economists (NRE's) and regional economists (RE's) with their wide range of knowledge in many resource areas have the broadest perspective for analyzing economic impacts related to ecosystem management. These individuals can become the core group of BLM's economic expertise, providing economics input, guidance and training, as needed, to BLM's management and ecosystem/ecoregion teams.

In addition to NRE's and RE's the BLM will still need economists with specialized and/or resource specific expertise to work with resource specific ecosystem problems. As an example, minerals appraisal activities require such specialized expertise. These appraisals are required by legislative edict and, thus, will continue under ecosystem management. Therefore, the economists assigned to this effort will need to be as much a part of the ecosystem management organizational structure as NRE's and RE's. Given this need for both broad and specialized economics skills, the Bureau will need to match its projects or activities with BLM economist(s) who are best able to do the job.

Communications
E-no.1

Team Work and Training

This study indicated that respondents favor having economists on interdisciplinary ecosystem/ecoregion teams. By having its economists work with other specialists in interdisciplinary ecosystem teams the skills of any one specialist on the team will bolster (and be enhanced by) the skills of the other team specialists. In effect, the team members will be training each other in their given specialties as they work together to accomplish their various team objectives.

The team approach to management is also very important in achieving the objectives inherent in integrated enviro/economic accounting and in identifying and controlling externalities related to ecosystem management activities. Both integrated enviro/economic accounting and externalities potentially involve physical, biological, sociological, and economics impacts/trade-offs related to BLM management actions. Therefore, to fully identify and track these impacts and trade-offs the BLM will need management advisory teams composed of specialists in the physical, biological and social (which includes economics) sciences.

The BLM's economists will need to keep informed on the latest methodology and technology. The BLM should see that such training is made available to economists and managers needing it. One way for the Bureau to inject economics into management planning and actions is for its manuals and handbooks to include instructions on applying economics to management operations. In addition, the Phoenix Training Center should provide BLM management with training in public resource management related economics.

Data Needs

Under ecosystem/ecoregion management, the Bureau's economists will need to be able to value all benefits and costs of BLM actions consistently and accurately so that all resources involved in tradeoff situations are justly and equitably represented. To do this they will need more complete and current data, especially below the county level. To help accomplish this, the BLM will need to provide its economists with technology (especially computer capability) which is modern, flexible, and compatible enough to enable these economists to coordinate with, and benefit from, their contacts with other entities that are sources of needed data.

Cooperation and Coordination

Additional studies are needed to determine to what extent and by what methods the BLM should exchange data and engage in cooperative efforts with other public and private entities relative to economic analyses for ecosystem/ecoregion management. Some areas for further study include the use of more cooperative agreements, MOU's, and other instruments of agreement and the specifics involved in employing such instruments, such as required restrictions, levels of compensation, extent of necessary supervision, areas of need, etc.

Summary of Recommendations

The following table presents a summary of various recommendations intended to help BLM improve its economics capability and to raise the level and quality of the economics information input into its management activities. These recommendations are grouped by major issue, such as integrating economics into BLM programs, organization and staffing, career paths for economists, etc. Under each issue there are one to five specific recommendations. Each recommendation has a priority assigned to it and a suggested time frame for completion or implementation. Those recommendations assigned a high priority should be implemented first, because they will have the greatest, immediate, impact on the strength of the Bureau's economics capability.

ISSUE	RECOMMENDATION	PRIORITY	TIME FRAME
Integrating Economics into BLM Programs	1. Manuals and Handbooks - incorporate economics into all manuals and handbooks as they are revised for ecosystem/ecoregion management.	HIGH	Drafted before structuring teams
	2. Management Training - an overview of economics and the changes to manuals and handbooks could be part of training management in ecosystem/ecoregion management.	HIGH	Drafted before structuring teams
	3. Hire Economists into Management - include economics skills in the qualification standards for management positions.	HIGH	Ongoing effort
Organization and Staffing	1. Put more economists in field locations, working with specific resource areas and ecosystems/ecoregions.	HIGH	Within budgetary constraints
	2. Establish a Senior Economics Advisor position attached to the Director.	HIGH	Within budgetary constraints
	3. Establish a Lead Economist position at the State Office level.	HIGH	Within budgetary constraints
Budget for the Function	Provide a specific funding allocation, through a flat surcharge on all programs that require or are supported by economic analysis on an interim basis until funded at ecosystem level.	HIGH	Implement with FY 1995 Budget
Career Paths for Economists	1. Re-evaluate current classification standards.	HIGH	With ecosystem approach
	2. Create group leader or Chief positions where teams of economists are established.	HIGH	With ecosystem approach
	3. Hire entry level or coop students where journeyman economists are not required.	HIGH	With ecosystem approach
	4. Establish higher graded senior economist and agency liaison or training positions at SO, PTC, or WO.	Moderate	As possible
	5. Expand economics skills qualifications for line management positions to allow economists to compete.	Moderate	As possible
Retention of Economists	1. More closely evaluate the duties and responsibilities of the existing economists in reclassification.	HIGH	Immediately
	2. Provide strong support for the economics program (funding, decision making, etc.).	HIGH	Immediately
	3. Provide continuing education or education scholarships to enhance the knowledge and skills of existing economists.	Moderate	As possible
	4. Establish exchange programs with other agencies, IPA's and Universities.	Moderate	As possible
Economics Data Needs	1. Fund contracts with universities to collect or disaggregate data.	HIGH	Ongoing effort
	2. Initiate data sharing agreements or MOUs with other governmental or private agencies.	Moderate	As needed
	3. Develop regulations and procedures that allow BLM to acquire and protect confidential data received from other agencies.	HIGH	Immediately

ISSUE	RECOMMENDATION	PRIORITY	TIME FRAME
	4. Develop standard survey instruments approved by OMB to collect data on such things as recreation use.	Moderate	As possible
	5. Ensure open-ended ADP system design (current and target) to allow incoming data to be received in alternate formats.	HIGH	Immediately
Economics Research	Fund research for new techniques such as valuation methodologies non-consumptive use.	HIGH	As possible
Enviro/Economic Accounting	Structure a system of integrated enviro/economic accounting through study, input analysis, public participation & decision analysis	HIGH	With ecosystem approach

INTRODUCTION

As background for this report, all employees in BLM who are classified under the General Schedule series as 0110 economists, plus a number (but not all) of Bureau economists who are employed in other specialties, were contacted and questioned in order to determine their views on BLM's current economics capability and how to strengthen BLM's economics components relative to the ecosystem/ecoregion management concept. The specific questions posed to these individuals are contained in the data input request presented in Appendix A. Out of the 33 economists contacted with the data input request about 90 percent returned written responses to these questions.

Not all economists working in other specialties in the BLM were contacted for this project because of the short time frame set for the completion of this report and the difficulty in identifying a complete list of all the individuals with training and expertise in economics. Those who were identified too late to be queried for this report are listed in Appendix B. There is currently no systematic way in the BLM of determining who these people are; therefore, only those persons who were known to the members of the report team as BLM economists working in other specialties were contacted. A more detailed census of the Bureau is needed to locate all of its economics talent. A detailed census of the Bureau is also needed to locate and profile BLM employees who have training and/or work experience in sociology and socio-economics, because economics and sociology are interwoven components of any potential impacts to the public from BLM management activities.

This report also presents comments from various management contacts who expressed their views regarding the need for economics input into management decisions, and indicated where in the decision process this input should come. Both the economists and management expressed positive opinions regarding the need for economics expertise and input into management activities.

This report is comprised of the following six topics:

CURRENT BUREAU ECONOMIC EXPERTISE

This section of the report documents the economic expertise existing within the BLM and the Bureau areas and functions where economics is currently being applied. It is a summation of the professional characteristics and logistics information received from BLM economists, and provides a base for determining BLM's economics capability with regard to the ecosystem/ecoregion management concept.

ECONOMISTS' VIEWS ON ECONOMICS CAPABILITY

This section presents the responses of BLM economists to specific questions directed to them as well as other comments volunteered by these respondents. Comments address such subjects as a) current situations and needs which are affecting the efficiency of economists within the BLM, b) management situations that will result in a need for economic analyses under the ecosystem/ecoregion concept of resource management, c) suggested staffing patterns for BLM economists, d) use of contractors to supplement BLM economics capability and e) other suggestions for improving the economics capability of the BLM both generally and with regard to ecosystem/ecoregion management. (See Appendix C.)

MANAGEMENT'S PERSPECTIVE ON THE ROLE OF ECONOMICS

This section presents the results of interviews conducted with about 20 management contacts in and around the Washington Office (WO) to determine how they view the role of economists/economics in BLM. It also includes comments by various BLM State Offices.

ECOSYSTEM/ECOREGION MANAGEMENT

Before the role of economics and economists in ecosystem management can be determined, certain concepts related to ecosystem/ecoregion management need to be defined. Defining these concepts will provide a base of reference for deciding where economics and economists fit into ecosystem/ecoregion management. Unfortunately, many questions and problems potential to the application of economics to this management concept will require consideration and study beyond the scope and time frames of this report. Some of these potential study areas will be addressed in section six of this report, "Recommended Solutions And Areas Of Further Study".

Some of the concepts and issues associated with ecosystem/ecoregion management are presented in this section of the report by members of the report's preparation team and are intended to indicate the need for a close relationship between economics and ecosystem/ecoregion management.

Some of the items covered in this section include:

a) a definition of ecosystems and ecoregions,

b) a description of the Government's basic management objectives for ecosystems and ecoregions,

c) a discussion of the anticipated tasks BLM must perform and the functions BLM must engage in to achieve its ecosystem/ecoregion management objectives,

d) a description of BLM's role in ecosystem/ecoregion management relative to that of other entities managing natural resources within the same ecosystems and ecoregions,

e) the degree of consistency and cooperation anticipated to be needed between management entities (including such things as personnel/job skills, data, management and analytical concepts, methodology, and technology),

f) an estimate of possible public concerns relative to land management under the ecosystem concept, and

g) anticipated budget issues which might need to be addressed under the ecosystem management concept.

OTHER ISSUES AND CONCERNS

This section of the report, presents concerns and suggestions by the preparers of the report relative to economics and natural resource management. These comments are based upon information presented in sections 1 through 4 as well as the preparers' own insights and knowledge of BLM's economics capability and BLM's potential requirements/needs for economics input into the ecosystem management process. The preparers of this report are listed after the Appendices.

Some of the issues addressed in this section are as follows:

a. How will BLM economists deal with ecosystems or ecoregions which are composed of more than one, homogenous economics region and may incorporate a variety of economics regions? Or a situation where one economics region may cross into, or over, more than one ecosystem or ecoregion? Or a situation where an ecosystem or ecoregion may cross over various counties, or across state lines?

b. What provisions are going to be made in the BLM budget to support the economics portion of BLM's ecosystem/ecoregion management efforts to ensure that the needed economics input to the BLM management effort is realized in a continuous and efficient manner?

c. What steps will BLM take to enable its economists to rise in grade to senior economist status and to stem the current tendency of economists to leave the profession in order to obtain higher status in the Bureau?

d. Suggestions for research to strengthen economics programs.

RECOMMENDED SOLUTIONS AND AREAS OF FURTHER STUDY

This section will:

a. Determine alternative solutions to the current problems and concerns expressed above. Recommend the alternative(s) that seem(s) to have the most potential for resolving these problems and concerns. Justify the choice(s) made.

b. Determine the alternative(s) that seem(s) to have the most potential for improving and maintaining, over the long-term, BLM's capability to provide necessary economics input into its natural resource management efforts, including those for ecosystems and ecoregions. Provide justification for the choice(s).

c. Recommend any subjects requiring further investigation and problem resolution. Explain why this further consideration is needed.

CURRENT BUREAU ECONOMIC EXPERTISE

One of the driving forces behind this investigation is to identify Bureau personnel that are either currently working as economists, or have training or experience as economists but are now working in other specialties or in management positions. Several questions within the data collection instrument (see Appendix A) were designed to obtain this information from those questioned. A summary of the professional characteristics and logistics information obtained from those who responded to this inquiry is presented in the following section of this report. Information on economists who did not respond to the inquiry is not presented in the following tables and charts. However, some information for such persons is provided in Appendix B of this report.

STATUS OF BLM ECONOMISTS

A total of 32 BLM employees were identified and asked to respond to the questions used to develop this report. One additional employee responded to the data collection form who had not been previously identified as having economic expertise, which resulted in a total of 33 employees being contacted. This total includes 22 employees classified as GS-0110 economists plus 11 economists who have transferred to other specialties. The latter indicated that they have transferred to other specialties mainly because they had no opportunities for advancement as BLM economists beyond the GS-12 level. Overall, 30 employees out of the 33 individuals contacted, or about 90 percent, responded to the data collection inquiry.

Some of the respondents to the inquiry subsequently identified additional BLM employees with economics training and expertise. These individuals were not identified in time to be included in this report but are listed in Appendix B. They represent an additional source of BLM economic expertise. A more thorough census of all Bureau employees may reveal even more individuals with suitable economics training that could be utilized by the ecosystem/ecoregion management teams.

The respondents were asked to provide information on their education and work experience including their specific fields of specialization. For the purpose of this analysis, their fields of specialization have been grouped into seven broad categories including: natural resources, regional, agricultural, industry, mineral and energy economics; chemistry and science; and minerals and land appraisals. Figure 1 presents the distribution of the these areas of specialization for the 30 respondents included in this study. It should be noted that most of the respondents have multiple areas of specialization, so the total number of responses tabulated in this histogram exceeds the number of respondents.

Of the respondents, there are about 21 who can be classified as natural resource economists (NRE's) because of their training and/or job experience (see Table 1). For purposes of this report, a natural resource economist is one whose education and/or experience has resulted in a comprehensive understanding of the economics interactions possible among the various natural resources, and of methods used to value resources and externalities not valued by the market. They also understand and can apply public well being concepts and optimization economics to natural resource management when necessary.

Of these 21 NRE's, 19 are also regarded in this report as regional economists (RE's) because of their training and/or expertise in the field of regional economics. A regional economist is defined as one who (among other things) has training and/or experience in macro economics and understands the interrelationship of economic sectors at the county, state, and national levels. Out of the 30 respondents, 26 were determined to be RE's. This category of specialists includes the largest number of BLM economists. This fact is not surprising, given the large number of BLM economists that are performing planning and environmental analysis work.

Table 1 also shows that numerous economists among these NRE's and RE's also had various other economics specialties, such as agricultural, industrial, micro, forestry, mineral/energy, and international economics. Some were also knowledgeable in such subjects as quantitative methods, statistics, econometrics, accounting, business, computers/modeling, engineering, paleo, the biological sciences, chemistry, sociology and rural sociology. Therefore, these NRE'S and RE's should be regarded as the most generalized economists within the Bureau, having the ability to deal with the broadest range of economic issues. In fact, all of BLM's economists can be classified under more than one economics specialty and have numerous other skills.

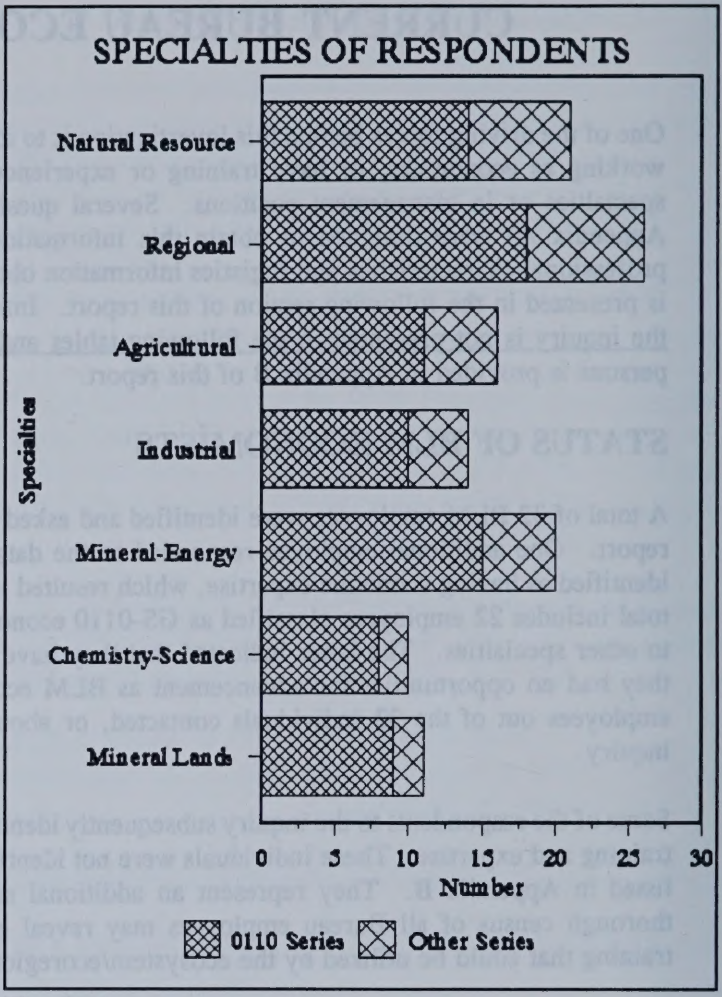

Figure 1

Respondents with specialized skills in the field of energy and minerals represented the next largest grouping. Twenty individuals reported training and/or experience with economic analysis of energy or mineral related resources. Again, this high concentration of expertise in the minerals field is understandable given the fact that much of the BLM's economic analysis work is focused around minerals related functions.

Overall, Figure 1 and Table 1 show that individuals with economics training and expertise in the Bureau generally have a diverse background in the areas of specialization that are required to support the Bureau in its management of public resources. However, restructuring of current organizational boundaries into ecosystems may not permit sufficient coverage of all the required areas of specialization within each ecosystem.

ECONOMICS TOOLS

Table 2 indicates which economic analysis tools are used and understood by the various respondents. Between 55 and 65 percent of the respondents said they make use of, or are versed in, input/output (I/O)

TABLE 1

BLM'S ECONOMICS CAPABILITY BY SPECIALTIES 1/

RESPONDENT	LOCATION	NAT.RES. 2/		REGIONAL 3/		AGRI.		INDUST. 4/		MIN-ENERGY		CHEM-SCI.		MIN-LN.APP.		OTHER SPECIALITIES 5/
		ED.	EXP.	ED.	EXP.	ED.	EXP.	ED.	EXP.	ED.	EXP.	ED.	EXP.	ED.	EXP.	
ALLEN, ROY	WSO-920A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	MICRO, MACRO, INTERNTL.TR.
BAYS, DALE	OSO-933	O	X	X	X	O	X	O	O	O	X	O	O	O	O	FORESTRY
BORKOSKI, JAMES F.	AKSO-985	O	O	X	O	X	X	O	O	O	X	O	O	O	X	
BRODERICK, JOHN	WO-690	X	X	X	X	X	X	X	X	O	X	X	O	O	O	QUANT, R.SOC, MICRO, TAXES
CABE, LOREN	MSO-950	O	O	X	X	O	O	O	O	O	O	O	O	O	O	MICRO, MACRO, INTERNTL.TR.&ECON
EIKENBERRY, BILL	WSO-910	X	X	X	X	X	X	O	X	O	X	O	O	O	O	MICRO, MACRO, COMP.MODELING
FITZPATRICK, KEN. T.	ES0-920	O	X	O	X	O	O	X	X	X	X	X	X	X	X	
FRAZIER, STAN	OSO-955	O	X	O	X	X	X	O	O	O	X	O	O	O	O	
GEEHAN, PATRICK H.	OSO-920	O	O	O	O	O	O	O	O	X	X	O	O	O	O	COAL LEASING POLICY
HUGHES, ED	MSO-920	O	X	O	X	O	O	X	X	X	X	O	O	O	O	FINANC.&PROJ.ANALYST, MICRO
LEUDERS, AMY	WO-840	O	O	X	X	O	O	X	O	O	X	O	O	O	X	TAUGHT COMP.MODELS:MIN.EVAL
MACKALLOR, JULES	ESO-920	O	X	X	X	O	O	X	X	X	X	X	X	O	X	MIN.GEO, ENG, METLRGY, PALEO, BIO
MARTIN, JOHN V.	ISO-932	X	X	O	X	X	X	O	O	O	O	X	X	O	O	MARINE EC, AG.BUS, EA, EIS, RMP
MARTINSON, FRED K.	SC-210	O	X	O	O	O	O	O	O	O	O	X	X	O	O	MNGMNT.SCI, OPER.RES, CHEM.ANAL
MILTON, ROBERT T.	UT-MDO	X	X	X	X	O	O	O	O	O	O	O	O	O	O	COMP.MODLNG, WLDLF&WTSHD EC.AN
MOORE, STEVE	CO-GJDO	O	O	O	X	X	X	O	O	O	O	O	O	O	O	
MYERS, PAUL	NSO-932	O	X	O	X	O	X	O	O	O	X	O	O	O	O	MACRO, INTERNATIONAL
NIELSON, MAX R.	USO-921	O	X	O	X	X	X	O	X	O	X	O	O	O	X	ST.CERT.GEN.APPR, REAL.SP.
PEDERSON, JOHN A.	WSO-920	O	O	O	X	O	O	X	X	X	X	X	X	O	X	GEO.ENG, MINING ENG, HAZARDS
PINDELL, DARLA	WSO-920a	O	O	O	O	O	O	X	X	O	O	O	O	O	X	ACCT. (CPA), TAXES, MICRO
PRANZO, JEANETTE	CSO-931	X	X	X	X	O	O	O	O	O	X	O	O	O	O	SAGERAM PR.FILES, EIS:NAT.&REG.
ROMANIELLO, CHUCK	CSO-923	X	X	O	O	O	X	O	O	O	X	O	O	O	X	RANGE REFORM EIS
RUNYON, LESLIE F.	OSO-930	O	X	X	X	O	X	O	O	O	O	O	O	O	O	FORESTRY, REC., GRAZING, LN.EXCH
SANTMYER, CARL L.	WSO-934	X	X	X	X	X	X	O	O	O	O	X	O	O	O	INTERNTNAL, PUB.UT, MICRO, MACRO
SOKOLOSKI, DAN	WO-600	X	X	X	X	X	X	O	X	O	X	O	O	O	O	WTRES, WELF.TH, INSTITU.EC, BUDG
SU, TEDDY	WO-690	O	O	X	X	O	O	X	X	O	X	O	O	O	O	STAT, ECONOMET, QUANT.METHODS
THOMPSON, JOHN	MSO-933	O	X	X	X	X	X	O	O	O	O	O	O	O	O	POLITICAL SCIENCE, MICRO
TOPPING, CLYDE P.	WO-690	O	O	X	X	O	O	O	X	O	X	O	O	O	X	INTERNTL, DEVELOPING COUNTRIES
WILLIAMS, JEFF T.	USO-934	X	X	O	X	O	O	O	O	O	O	X	O	O	O	RANGE SCIENCE
YOUNG, JOHN	WSO-920a	O	X	O	X	X	X	O	X	O	X	X	X	O	X	ANIMAL SCI, AG.SYSTEM ANALYSIS

FOOTNOTES

1/ Information displayed on this table was supplied by the listed respondents. The key to the abbreviations is the Dictionary of Table Terms at the end of this document.

2/ For purposed of this report, a natural resource economist is defined as one whose education and/or experience has resulted in a comprehensive understanding of the economics interactions possible among the various natural resources, and of methods used to value resources not valued by the market. They also understand and can apply public well being concepts and optimization economics to natural resource management when necessary.

3/ It is assumed for this report that respondents with regional education and experience have a working knowledge of macro economics.

4/ It is assumed for this report that respondents with industrial education or experience have a working knowledge of micro economics.

5/ These are specialities which are more recipient specific than those listed in the preceeding categories, see the Dictionary of Table Terms at the end of this document for definitions.

and/or benefit/cost (B/C) models and analytical techniques. More than one third indicated that they are skilled with regression techniques, 9 with trends analysis, 8 with discounted cash flows, 5 with farm and ranch budgeting, 6 with accounting, 4 with linear programming, 6 with statistics, 3 with net present value techniques, and 3 with Monte-Carlo risk analysis. There were also some respondents who mentioned using other tools, such as simulation, econometrics, sales and income capitalization, appraisal techniques, and various analytical models.

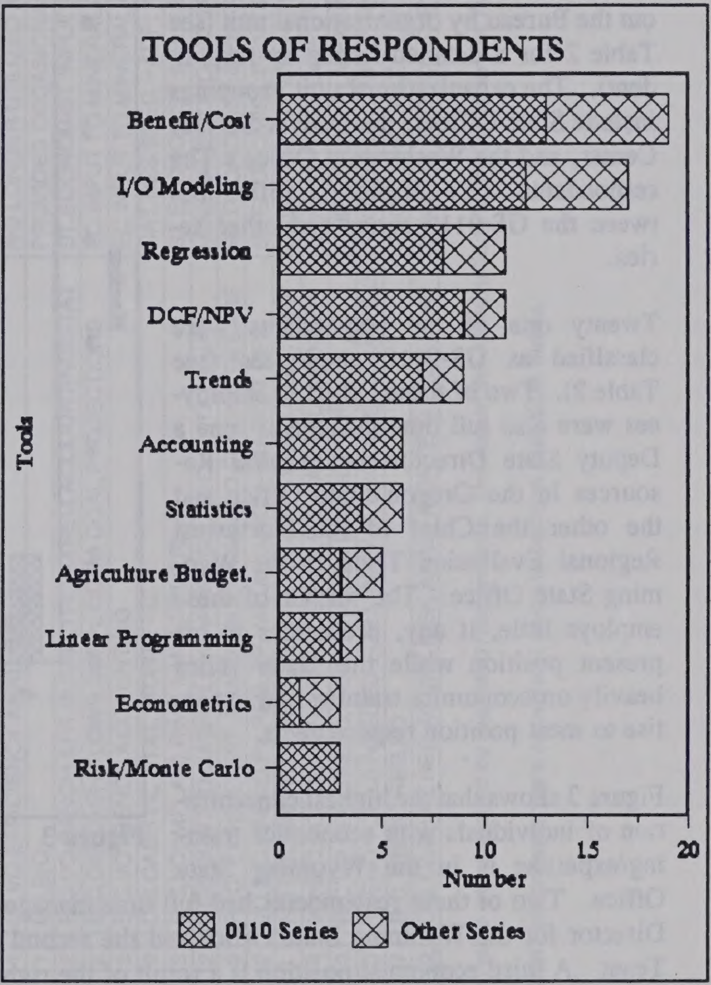

Figure 2

Figure 2 has been prepared to graphically summarize the availability of analytical tools and skills reported by respondents to the survey. This Figure clearly illustrates the importance of B/C and I/O analysis skills to BLM economists. These two analytical techniques are probably most widely utilized for environmental assessments and planning purposes. They are essential economics skills for economists evaluating resource values and tradeoffs and determining the public costs and benefits of Bureau programs and activities. They will be equally important components of analyses in the ecosystem approach to management.

While skills in regression, cash flow analysis and trends analysis are only used by about one third of the individuals with economic expertise in the Bureau, these tools are important components in many economic analyses in the BLM. For instance, discounted cash flow analysis and other forms of net present value analysis are essential tools for economists estimating the fair market value of the lands and minerals that the Bureau is leasing, selling or exchanging. The use of cash flow analysis techniques is probably more isolated to individuals on the regional mineral evaluation teams. The other lesser used evaluation tools such as accounting, trend analysis, statistics, econometrics and risk/monte carlo analysis also tend to be utilized for specific applications such as minerals evaluation.

In illustrating skills distribution, Figure 2 stratifies the employees into those who are presently in positions in the GS-0110 series and those employees serving in other non-economist roles. Without exception, there is at least one or more GS-0110 economists in each of the skill areas. Based on the results presented in Figure 2, the conclusion can be drawn that BLM economists have sufficient overall capability to employ the analytical tools needed under the current organizational structure as well as those that will be required under an ecosystem approach to management.

CLASSIFICATION AND LOCATION

Thirty employees out of the 33 individuals contacted, or about 90 percent, responded to the data collection inquiry. Figure 3 presents a histogram of the distribution of these employees throughout the Bureau by organizational unit (see Table 2 for a detailed listing by respondent). The organizational unit groupings include State Offices, the Denver Service Center, and the Washington Office. The respondents were further stratified between the GS-0110 series and other series.

Twenty one of the respondents were classified as GS-0110 employees (see Table 2). Two of these GS-0110 employees were also full time managers: one a Deputy State Director for Mineral Resources in the Oregon State Office and the other the Chief of the Northwest Regional Evaluation Team in the Wyoming State Office. The former of these employs little, if any, economics in his present position while the later relies heavily on economics training and expertise to meet position requirements.

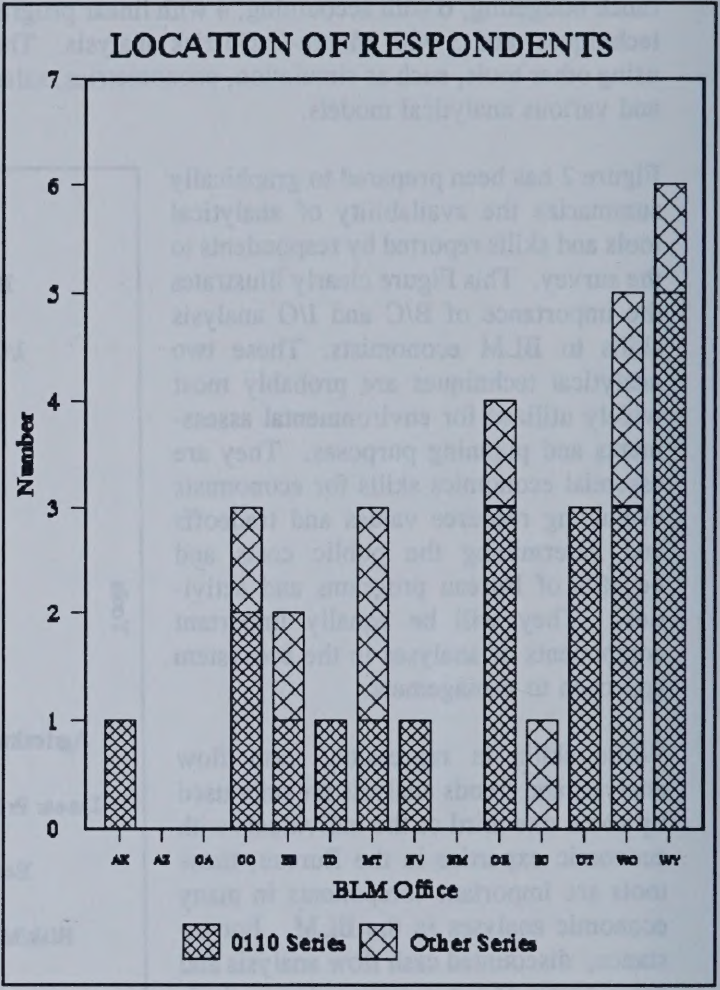

Figure 3

Figure 3 shows that the highest concentration of individuals with economics training/expertise is in the Wyoming State Office. Two of these respondents had full time management responsibilities: one as the Associate State Director for the Wyoming State Office and the second as Chief of the Northwest Regional Evaluation Team. A third economist position is a result of the rightsizing effort by the Washington Office and this position has national as well as local responsibilities. Of the remaining three economists in Wyoming, two were assigned to the Northwest Regional Evaluation Team and the third to the Division of Lands and Renewable Resources.

The higher than normal distribution of economists in Wyoming can be explained by the heavy concentration of minerals workload in this region. Four of the five GS-0110 economist positions were directly linked to minerals valuation through the Northwest Regional Evaluation Team and the Washington Office rightsized position. In both instances, these individuals are assigned to regions that included areas outside the boundaries of Wyoming. In addition, the State Office Economist in Lands and Renewable Resources has a heavy work load in planning and regional evaluation due in part to the concentration of energy and minerals activity in the State.

TABLE 2

BLM'S USE OF ECONOMIC EXPERTISE 1/

RESPONDENT	LOCATION	SERIES	GRADE	ECONOMICS TOOLS 2/	CURRENT POSITION MAJOR FUNCTION
ALLEN, ROY	WSO-920A	0110	13	I/O, B/C, DIS. CASH FL, REG, CLUSTER, MONTE-C, FREQ. DI.	CHIEF-ECONOMIC EVAL-MIN.
BAYS, DALE	OSO-933	0110	12	COMMUNICATIONS, DATA BASE, PNV, IMPLAN	PLANNING-ECONOMIST
BORKOSKI, JAMES F.	AKSO-985	0110	12	ENVIRONMENTAL ACCOUNTING	MIN.LN EXCHANGE EVAL.
BRODERICK, JOHN	WO-690	0110	14	CON. &OPER. EC. MODELS, SIMULAT, REG, B/C, LP, I/O	MIN.POLICY&ECON. EVAL
CABE, LOREN	MSO-950	1343	12	ECONOMETRICS, I/O, B/C, PUBLIC FINANCE	ECONOMIST-PANAMA CANAL WTRSHD ECOSY
EIKENBERRY, BILL	WSO-910	0340	15	I/O, B/C, REG, STAT. ANAL, TIME SERIES, FORCASTING	ASSOCIATE STATE DIRECTOR-WYOMING
FITZPATRICK, KEN. T.	ES0-920	0110	13	I/O, B/C, COMPARABLE SALES&INC. CAPITALIZATION	CHIEF-ECONOMIC EVAL-MIN.
FRAZIER, STAN	OSO-955	0334	13	FRM. &RANCH BUDGETING, B/C, I/O	ST. DATA ADMIN. OR/WASH
GEEHAN, PATRICK H.	OSO-920	0110	14	INFORMATION NOT PROVIDED	DSD, MIN. RESOURCES OSO
HUGHES, ED	MSO-920	0110	12	B/C, I/O(RIMSII), DIS. CASH FLOW, NET VALUE, TREND, REG	INDUSTRIAL ECON. - DIV. MIN. RESOURCES
LEUDERS, AMY	WO-840	0343	13	DIS. CASH FLOW, ECON. EVAL. MINS. PROPERTIES &POLICIES	EVALUATION & MGMNT. ANALYSIS
MACKALLOR, JULES	ESO-920	1515	14	B/C, TRENDS, MULTIPLE REG, DIS. CASH FLOW, APPRAS. TECH	PLANNING, POLICY, STDS/GUIDELINES
MARTIN, JOHN V.	ISO-932	0110	12	I/O, B/C, FR. &RANCH BUDGET ANAL, ECON. MODELING, SOC	IDAHO BUDG IMPLEM. TEAM-ECOSY. MNGMT
MARTINSON, FRED K.	SC-210	1515	13	SVIM, STATISTICS, ECONOMETRICS, OTHER QUANT,	OPER. RES. AN-QUANT. TECH, ENV. MONTRNG
MILTON, ROBERT T.	UT-MDO	0110	11	LP, I/O, EFFICIENCY ANAL, B/C	NO LONGER UTILIZED AS AN ECONOMIST
MOORE, STEVE	CO-GJDO	0028	11	I/O, B/C	PROVIDES OCCASIONAL ECON. GUIDANCE
MYERS, PAUL	NSO-932	0110	12	B/C, I/O, RANCH &FR. BUDGT, TREND, REG, ACCOUNTING, STAT	ST. ECONOMIST: INPUTS EC. TO BLM OPER
NIELSON, MAX R.	USO-921	0110	12	B/C, DIS. CASH FLOWS, SUPPLY/DEM. COAL, PROJECTIONS	EC. INPUT TO MINERALS MGMNT. OPER.
PEDERSON, JOHN A.	WSO-920	0110	13	B/C, I/OTRENDS, ACCOUNTING	EC. INPUT TO MINERAL MGMNT. OPER.
PINDELL, DARLA	WSO-920a	0110	12	DIS. CASH FL, STAT, MONTE-C.	NAT. RES. SPEC. - ADP: ASSIST ECON.
PRANZO, JEANETTE	CSO-931	0110	12	B/C, I/O(IMPLAN), RIMS II MULTIPLIERS	ST. ECONOMIST: INPUTS EC. TO BLM OPER
ROMANIELLO, CHUCK	CSO-923	0110	12	DISCOUNTED CASH FLOW, APPRAISAL TECH., STAT. ANAL	MINERAL ECONOMIC EVALUATIONS
RUNYON, LESLIE F.	OSO-930	0110	9	REC. EXPEND. EST., RANCH BUDGT, MICRO, ELEC. DATA BASE	ST. ECONOMIST: INPUTS EC. TO BLM OPER
SANTMYER, CARL L	WSO-934	0110	12	I/O, B/C, TREND, PV, REG., LP, VALUING NON-MARKET RES.	ST. ECONOMIST: INPUTS EC. TO BLM OPER
SOKOLOSKI, DAN	WO-600	N/A	SES	NOT CURRENTLY USING ECON. TOOLS-STAFF USES THEM	DAD-ENERGY & MINERALS. RESOURCES
SU, TEDDY	WO-690	0110	14	I/O, B/C, ACCOUNTING, TRENDS, REG, DIS. CASH FLOW, COMP	EC/QUANTATIVE INPUT TO MIN. MNGMNT
THOMPSON, JOHN	MSO-933	0301	13	B/C, I/O, REG, TREND, FARM &RANCH BUDGETS, LP	CHIEF, BR. OF PLAN. &PROGRAM SUPPORT
TOPPING, CLYDE P.	WO-690	0110	13	TREND, TOOLS NEEDED FOR MIN. EVAL &SOCIOEC. ANALYSES	PROVIDES EC. INPUT TO MIN. EVAL &APP
WILLIAMS, JEFF T.	USO-934	0110	7	B/C, TREND, REG, I/O	ECONOMIST: P&EC, DIV. RENEWABLE. RES
YOUNG, JOHN	WSO-920a	0110	12	DIS. CASH FL, REG, ACCNT, RISK ANAL-MONTE C. TECH, STAT	MINERAL ECONOMIC EVALUATIONS

FOOTNOTES

1/ Information displayed on this table was supplied by the listed respondents. The key to the abbreviations is the Dictionary of Table Terms at the end of this document.

2/ These are the various tools that respondents were capable of using to perform their BLM duties.

The next largest concentration of economic expertise is in the Bureau's Washington Office where five of the respondents are located. With the exception of one individual who is located in the Division of Evaluation and Management Analysis (WO-840), the balance of these employees with economic expertise are located in the Division of Minerals. One of these respondents is the Deputy Assistant Director for Mineral Resources and the remaining three economists are located in the Division of Mineral Policy Analysis and Economic Evaluation (WO-690). Only one of the five WO employees with economics capabilities is assigned to a management position while three of the five are assigned to positions in the GS-0110 series.

Oregon is the State with the next largest grouping, with four respondents having economic expertise. One of these individuals is assigned to a full time management position as the Deputy State Director for Mineral Resources. Two individuals are assigned to positions within the GS-0110 series and the remaining employee with economics capability is in a position having automated data processing responsibilities.

The balance of the states within the Bureau have one to three employees with economic expertise. There is at least one GS-0110 employee in each state. The only exceptions are the states of Arizona, California and New Mexico where no GS-0110 employees were identified through the data collection process employed for this report. However, information subsequently received suggests that both California and New Mexico have employees that possess economics capabilities, but are not in series GS-0110 positions (see Appendix B).

Based on the data collected from the respondents, the BLM has numerous employees with expertise in economics and the majority of them have been contacted for this report. However, nearly one third of these employees are in specialties other than GS-0110. Such people would probably not be available to provide economics input to the Bureau on a routine basis. At best, these individuals would probably only be available for advice or consultation, given the ongoing requirements of their present positions. In addition, the distribution of employees with economics capabilities is not uniform throughout the Bureau. However, this clustering of economic expertise in selected areas is, to a large degree, a function of the type of work that is currently being required and performed by the BLM in each region. This work would certainly be impacted under an ecosystem/ecoregion organizational structure by the shortage of economic expertise in some geographic areas.

CURRENT POSITIONS AND JOB FUNCTIONS

Of the 30 percent of respondents (9) who are not classified in the GS-0110 economist series (see Table 2), 4 were serving in some type of management or administrative capacity and did not address economics as a part of their duties. Within this group of 4, there is a Chief of planning, a Data Administrator, a Deputy Assistant Director, and an Associate State Director. The remaining 5 employees with economic expertise that were in job classifications other than the GS-0110 series were all in non-managerial positions. These positions included: 1 individual working with wildlife and watersheds in a non-economist status; 1 employee providing economics input to the Panama Canal Watershed Ecosystem project; 1 individual working in a non-economist status with planning, policy, standards and guidelines; 1 individual who is engaged in evaluations related to management analyses; and 1 respondent who is engaged in operations research using quantitative techniques.

With regard to the other 21 respondents who are classified as economists (see Table 2), only 3 were in managerial positions. One is employed as a Deputy State Director for Mineral Resources the other 2 are both Chiefs of regional mineral economic evaluation teams. Of the remaining 18 economists, 10 are involved in various aspects of the minerals program. Collectively, the minerals function within the BLM employs 13 of the 21 economists classified in the GS-0110 job series. Therefore, mineral economic evaluations and other minerals functions account for nearly 62 percent of the work load of employees in the economist series.

The next largest group of economists are responsible for providing economics input and analysis to the planning and environmental assessment function. Six economists, or nearly 29 percent of employees in the GS-0110 job series, were employed in this function. Of the 2 remaining respondents classified by the GS-0110 series, one is working with the Idaho budget implementation team for ecosystem management and the other, even though classified GS-0110, is no longer functioning as an economist.

Collectively, only 20 of the 30 respondents, or about two thirds of the employees with expertise in the field of economics, are actively functioning as BLM economists and more than half of these individuals are directly linked to economic analyses in the minerals field. Based on these statistics, the current work load for economists in the Bureau is highly focused on mineral evaluations and planning functions.

GRADE LEVEL AND DISTRIBUTION

The above discussion has focused on the positions and functions held by economists and individuals with economic expertise in the Bureau, but has not considered the grade levels associated with these positions. Figure 4 presents the distribution of the grades for those employees who responded to the data collection form. This histogram shows a small number of employees holding positions in grades GS-7 through 11. This segment of the grade distribution represents only about 13 percent of the respondents, with no individuals in the entry level grades of GS-5 and 7.

Similarly, there are very few positions at the grades of GS-14 and above. In fact, the two positions at GS-15 and SES were occupied by individuals with expertise in economics but these are management positions that are not included in the GS-0110 job series. The GS-14 level is the highest graded position to be occupied by BLM employees in the GS-0110 series, and these positions are currently filled by one manager holding the position of Deputy State Director for Mineral Resources and two economists in the Washington Office. The forth position is also assigned to the Washington Office and it is a rightsized position located in the Eastern States Office. These positions appear to represent the upper end of the career ladder for employees in the GS-0110 series and are not typically available in field locations. Field positions generally do not exceed the GS-12 level.

The vast majority of the economists positions are graded at the GS-12 level, which represents 40 percent of the 30 respondents included in this investigation. The bulk of employees included in the GS-13 grade level are either in a management role, or affiliated with the Washington Office as immediate staff, or are rightsized employees, most of whom were formerly stationed in the WO. There are two supervisory field level economists at this grade level and they are both responsible for heading a regional mineral evaluation team.

Typically the field level economists in the GS-0110 series range from the entry level to a maximum of GS-12. At the present time there is only one staff level economist at the GS-13 level and that is a rightsized position tied to the Washington Office. In order to advance beyond the GS-12 level the GS-0110 series economist must move into a management role or transfer to a staff level position in the Washington Office. However, the number of staff level economist positions at the GS-13 level is very limited in Washington and even fewer positions are available at the GS-14 level. Even more limiting is the fact that all the GS-13 and GS-14 level economist positions in the Washington Office are related to minerals functions, with no corresponding positions for economists in planning or renewable resources. From these statistics, it is readily apparent that the GS-0110 career path is extremely limited at the upper grade levels of GS-13 and above, which explains why so many former economists in the Bureau have moved into management and other fields in order to achieve career advancement.

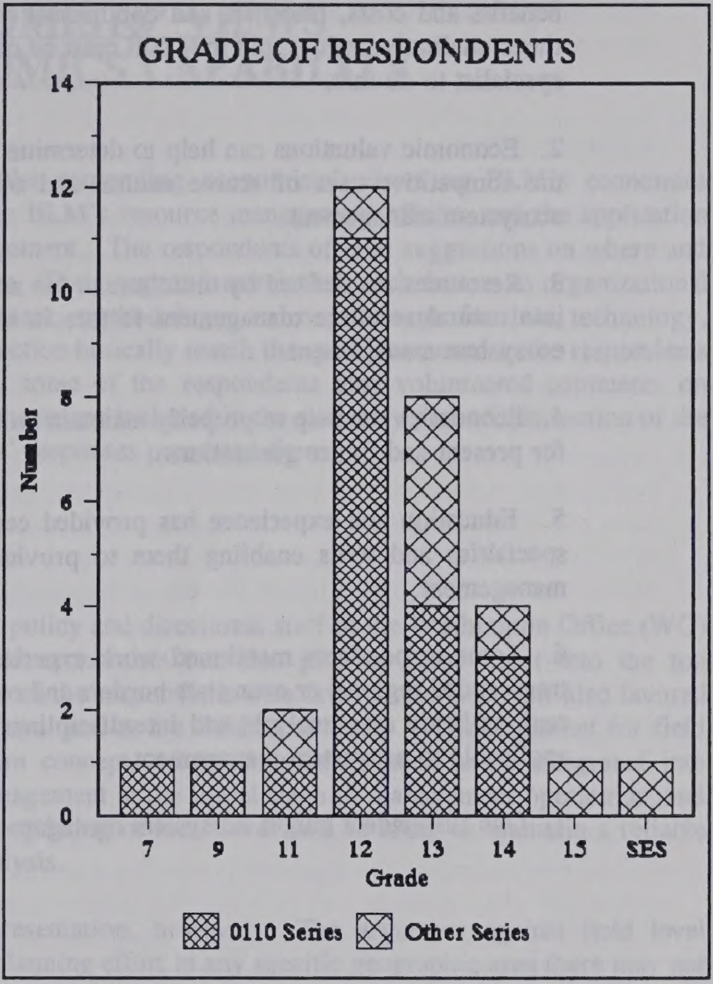

Figure 4

APPLICABILITY OF EXPERTISE TO ECOSYSTEM/ECOREGION MANAGEMENT

Out of 30 respondents 3 express no opinion on whether economics and their current capabilities and expertise could be applied to ecosystem management, 6 say that they did not know, and 21 are positive about the contribution that economics and their capabilities could make to ecosystem management. Overall, about 70 percent of the respondents felt their background and experience would be a positive contribution to an ecosystem based approach to managing public resources administered by BLM.

The following are some of the reasons given by those who determined that economics and/or their particular capabilities are applicable to ecosystem management:

1. Economists look at the total picture where resource management is concerned. They look at the benefits/costs and trade-offs related to both market and non-market oriented resources. Economists determine who receives the benefits of a resource management action and who pays the costs. Economics looks at opportunity costs incurred by opportunities foregone when resources are used/expended in one way rather than in some other alternative manner. These

benefits and costs, tradeoffs and opportunity costs sometimes have dollar values and at other times qualitative values, but they still must be determined and the economist is the most qualified specialist to do this.

2. Economic valuations can help to determine the most beneficial/optimum outcome regarding the competitive uses of scarce natural and other resources, including resources involved in ecosystem management.

3. Resources are defined by their human use and applications, and the integration of economics into natural resource management factors in this human element. This will also be true for ecosystem management.

4. Economics can help to properly maintain an ecosystem and sustain its values and productivity for present and future generations.

5. Education and experience has provided certain of the respondents with a broad range of specialties and tools enabling them to provide valuable input to ecosystem/ecoregion scale management.

6. Some respondents mentioned work experience that involved large geographical areas that transcended regional or even state borders and required dealing with a variety of specialists. This regional/wide area analysis and interdisciplinary approach to resource management is directly applicable to ecosystem management.

7. One respondent taught ecosystem management courses while a graduate student.

ECONOMISTS' VIEWS ON ECONOMICS CAPABILITY

This section of the report presents only the responding economists' views on BLM's economics capability, the need for economics input into BLM's resource management efforts, and the application of economics to ecosystem/ecoregion management. The respondents offered suggestions on where and how to improve BLM's economics capability. Their suggestions relate to such factors as organizational structure; personnel requirements and placement; methodology; and requirements for data, technology, and equipment. The headings used in this section basically match the questions posed to the respondents in the data inquiry instrument. However, some of the respondents also volunteered comments on additional subjects. These volunteered comments are included in the summary part of this section of the report as part of the summary of economists' responses presented there.

ORGANIZATION

The majority of respondents favored a small policy and directional staff in the Washington Office (WO) that would not only advise and assist field economists but also provide some input into the top management decision making process. Most of the respondents who favored the WO staff also favored having economists at the State Office (SO) level and at the field/local level. The argument for field level economists is based on: (1) the team concept, where economists need to be integrated into interdisciplinary teams that interact with management at the initial stage of management operations, and (2) the need for continuous acquisition and updating of local level data in order to maintain a reliable economics database for use in economic analysis.

Some respondents rejected field level representation, however. The argument against field level economists is that in the absence of a major planning effort in any specific geographic area there may not be enough economics related work to justify a full time economist. In response to this concern, several respondents suggested more centralized organizational structures with economists that would serve multiple ecosystems or ecoregions. In the case of solid mineral economic evaluations, this function has already been centralized into regional evaluation teams that serve multi-state regions. These respondents also pointed out centralization as a means of reducing the cost of the economic analysis through a more even distribution of work loads, reduced staffing requirements, and improved efficiency on repetitive tasks. Two respondents suggested placing some economists at the local level for analyzing resources and commodities that serve local markets but having economists centralized at regional or national levels when evaluating commodities sold in regional or national markets.

There were several comments indicating that the Denver Service Center (DSC) might be an inappropriate location for an economics staff, even though Denver is recognized as somewhat of a western hub for various agencies concerned with land management activities. Several respondents noted that past attempts at locating support teams at the DSC were unsuccessful and expressed concern that future efforts may achieve similar results. Along these same lines, some respondents strongly recommended against placing large review teams of economists at the DSC or WO unless they were functional, i.e. were available and willing to perform tasks and undertake projects, as needed, throughout the Bureau. As an alternative to the DSC staff, respondents suggested locating economists at the field level with some core team assignments to support small staffs at the WO. A more detailed discussion of the pros and cons of the specific organizational structure of economist within the Bureau is contained in this Section under "Economists' Suggestions For Staff And Contractor Utilization".

PERSONNEL

Remarks dealing with specific personnel issues mainly focused on the need for additional economists at the field level and the need for additional economics skills and training. There were numerous suggestions to hire resource economists at the SO level. One respondent suggested hiring specialty economists at the local level with zone or regional responsibilities. A few comments referred to utilizing economists more across state lines.

The majority of respondents indicated that, as a minimum, state offices will want to staff at least one resource economist. However, BLM will need to first delineate and define its ecosystem/ecoregion management areas and then complete an in depth assessment of the field/ground level skills required to carry out effective management of those specific ecosystems or ecoregions before it can determine the appropriate staffing levels and training needs for its economists. Respondents also indicated that they believe that the full integration of economic information into the BLM's decision making processes is necessary, but it will require field level input by economists.

TECHNOLOGY AND EQUIPMENT

Respondents recognized that modernization will be of help to BLM management endeavors, and there is concern that increased technological capabilities are required. There is a need to pool technology and various related resources with other agencies and within BLM. There is probably a need for standardized or specialized software as well as networking among states and among federal and state agencies in order to acquire general access to meaningful, applicable, and reliable data. There was a suggestion that we need practical access to the Internet system that is in use by most universities and government agencies. The BLM also needs to assure that its data system is flexible enough to enable economists and other specialists to continue to access the data bases, models, macros, software, etc. that they require and utilize on a routine basis to accomplish their work. This is especially true where there is no current substitution for these items or where creating a substitute would be a long, difficult, and/or costly endeavor.

Another suggestion involved utilizing the economics modeling capabilities of the Forest Service, and entering into cooperative agreements with other agencies and academic institutions. Modernization may need to consider economics data modeling as an integral part of the way BLM does business in the future. There is also a need for better access (such as networking) to the voluminous census data and to the economics data kept by state and county entities. As mentioned above, accessing these data sources will require BLM to have a flexible data processing capability that is not locked into only one operating system and software capability.

DATA

The stock and trade of the economist is utilizing data to measure trade offs between various types of benefits and costs. There is a continuing need for current and reliable data. Various governmental and private concerns maintain data that is useful for economic analysis; however, there is a shortage of meaningful economics data below the county level, especially in non-urban areas. Also, the geographic characteristics of politically and industrially defined areas, where current economics data may be available, may not correspond to the geographic characteristics of BLM's ecosystems and ecoregions once they are delineated.

The breaking away from traditional political boundaries (as state and county lines) for designating management areas will require new approaches to data gathering and analysis. This will require greater coordination and cooperation with other agencies and the academic community on data sources, trends, technology and techniques. In addition, expenditures may be required for studies that further refine this data down to smaller subregions, or to collect primary data in selected areas.

OTHER COMMENTS ON CURRENT AND FUTURE NEEDS

There is a need for a consistent approach to incorporating economic information and expertise into management's decision making processes. This will require a commitment by management to require economics as part of the BLM's operations and decision making processes, and to establish the economics program as a separate and distinct budget sub-activity with separate funding.

Standardized measurement/valuation techniques are needed for assessing and dealing with non-commercial values of such items as recreation, wilderness, and wildlife. To meet this objective, BLM needs to develop or adopt standards for its environmental accounting.

The Bureau needs to conduct legitimate benefit/cost analyses of proposed and ongoing programs to use as bench-marks for measuring the economic efficiency of these programs.

BLM needs to speak the same language and utilize the same terminology, units of measure, and data standards as other land management agencies, including those of state and local governments. This will require cooperative agreements with these other entities.

Ecosystem economics will require more field level specialization by economists to deal with the unique characteristics of ecosystems. There will also be an expanded role for the economist as a member of the interdisciplinary teams that will need to become an intrinsic part of ecosystem management.

ECONOMISTS' SUGGESTIONS FOR STAFF AND CONTRACTOR UTILIZATION

One item of the data collection statement asked respondents to supply input on alternative ways for BLM to acquire needed economic expertise and to fully integrate this expertise into the decision making process for ecosystem management. Those contacted were offered seven possible alternatives to consider when answering this question. The seventh alternative was open ended so that any additional options could be supplied. Respondents provided the following responses to this question. These responses have been aggregated and are depicted in the bar chart in Figure 5. In addition, the detailed replies of the individual respondents are tabulated in Appendix C.

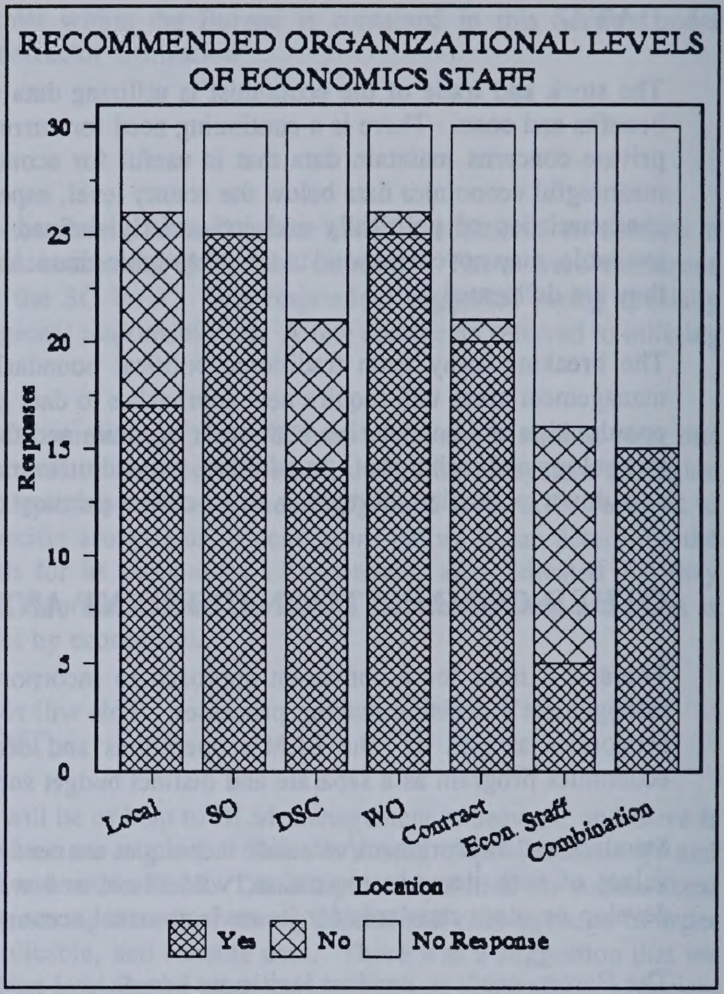

Figure 5

Figure 5 summarizes respondents' opinions of the seven alternatives. These alternatives included the following options: 1)staffing additional economists at the local level, 2) locating economists at the SO, 3) locating a staff of economists at the DSC, 4) placing economists in the WO, 5) establishing a specialized economics staff with solicitor type authority, 6) more extensively utilizing the economic expertise of contractors (especially universities), and 7) other.

In general, the responses show that placing economists in the State Office (SO) and on a limited basis in the Washington Office (WO) and the utilization of contractors (UC), especially universities, are the preferred methods for increasing BLM's economics capability. However, any recommendations to place economists at the Local Level (LL) were integrated with suggestions to also place economists in the SO's. Placing economists at the Service Center (SC) in Denver, and/or forming an economics staff (the SEC) that would function with regard to economics much as the solicitor's office now functions as a legal counsel and guide on legal matters for the BLM did not receive enthusiastic endorsement.

The various responses of those questioned are summarized below along with their related rationale.

Placement of Economists at the Local Level

There were 17 supporting and 9 opposing responses to this proposal. Four individuals did not express an opinion regarding the placement of additional economists at the local level.

Supportive rationale: This proposal would locate or assign an economist to each ecosystem/ecoregion as the expert on its economics data and related characteristics. This may require establishing a core team of field level economists that would be located at the primary planning level of BLM's ecosystem management operations, which is the most effective level at which to provide support.

Opposing rationale: BLM lacks the need for full time economists at this organizational level. Also, economists at this level tend to lack the interaction and feedback with other economists, or as with the state and Washington offices, that is necessary to maintain their expertise and technology.

Placement of Economists at the State Office

There were 25 supportive and 0 opposing responses for the SO proposal. Five individuals did not comment on this alternative.

Supportive rationale: This is the highest level of BLM's organizational structure at which the economist can be in proximity to field work and also maintain ongoing, professional relationships with other economists. An economist at this level also would have a full work schedule. For example, he/she could be engaged in minerals and other resource planning functions, such as developing models, providing guidance and input to actions related to the National Environmental Policy Act (NEPA) and ecosystem management decisions, and developing special resource values for such items as wildlife and recreation. However, some respondents indicate that it is hard to work at a resource area level if assigned to a SO, and economists are needed at the level where the impacts of ecosystem management decisions are made and felt.

Placement of Economists at the Denver Service Center

There were 14 supportive responses and 7 opposing ones for this proposal. Nine individuals did not express an opinion regarding the placement of additional economists at the Denver Service Center.

Supportive rationale: Economists at the DSC could provide assistance to the field offices in the form of methods, economics models (such as IMPLAN and RANCHLP) and their applications, price file updates, input-output and benefit/cost analysis, and non-market values. They could interface with other agencies (such as the Forest Service) and with universities, and could provide policy guidance. The DSC should be a user-friendly, operationally functional support group.

Opposing rationale: The Denver Service Center has been perceived as an academic effort that is isolated from actual problems. In the past, the DSC has been tried and has failed as a support facility. It should be noted, however, that under its new Director the DSC is expected to play a major role in Bureau activities, and any past problems that it may have had are expected to be resolved.

Placement of Economists in the Washington Office

There were 25 affirmative responses and 1 opposing response to placing a staff of economists in the WO. Four individuals did not comment on this alternative.

Supportive rationale: The Headquarters Office is closest to national issues and can relate to Congress and the Executive Office. Staffing in the WO will help assure adequate funding for the level of economic activity desired by BLM, and provide high level coordination with other agencies and other entities. It is the primary location to establish economics policy for the Bureau. The WO should provide technical advice to field offices and assure sufficiency of required economics inputs to the planning and decision making process at the ecosystem/local level. The WO needs a separate group in L&RR, similar to the Economic Policy Office now located in the Division of Minerals.

Opposing rationale: Several respondents cautioned against developing a very large policy staff at the WO, which tends to be isolated from the real world needs of the operational level field staffs. A slight variation of this alternative was to place a limited number of senior economists at the WO to support management, and to simultaneously develop core teams of field level economists that could help the senior economists with developing polices, manuals, etc. while still being fully functional as field level economists. This option would maximize the amount of on the ground staff actually performing economic analyses.

Utilizing the Economic Expertise of Contractors

There were 20 supportive responses and 1 opposing response to this proposal. Nine individuals did not express an opinion regarding the use of economic expertise from universities or other contractors.

Supportive rationale: If universities were the contractors, they could provide specialized support such as modeling, research and databases as well as the latest economics technology and other support that can not be provided in-house.

Opposing rationale: The results of such support tend to be institutionalized. If contracted expertise should prove unsatisfactory doesn't work out, the Agency would still need economists to complete the tasks. In addition, in-house economists would still be needed to manage the contracts.

Establishing a Specialized Economics Staff with Solicitor Type Authority

There were 5 affirmative responses and 11 opposing responses for this proposal. Fourteen respondents did not express a positive or negative opinion regarding this alternative.

Supportive rationale: Respondents expressed the need for a core group to assist all BLM offices with economics inputs as a separate program with its own funding.

Opposing rationale: Some comments indicated that economics input has to be integrated into the normal work flow as an assistance to the field level management. Those who opposed this alternative thought that the separate economics staff approach does not fit well into the team approach.

Other Suggestions

There were 5 other recommendations:

1. Formation of a socio-economics council to review present and plan future economics efforts;

2. Use the Phoenix Training Center (PTC) to provide training in economic analysis and ecosystem management;

3. Draw on economics staffs placed under the Assistant Secretary for ideas and for the latest economics tools;

4. Use the Intergovernment Personnel Act (IPA) exchange program with the states to obtain needed economics personnel.

5. Form a Bureau wide communication system.

SUMMARY OF ECONOMISTS' RESPONSES

In evaluating the organizational placement of additional economists to enhance the Bureau's economics capability, it is important to first identity where the various work is being performed. A review of the recommendations presented by the respondents places the activities of Bureau economists into three categories:

1. National level responsibilities for tasks such as: interfacing with political groups, budget support, policy direction and guidance, and headquarters oversight of economics programs. Policy considerations are seen largely as a WO function although there is support for a DSC role in this area. Another option regarding policy considerations involves using core teams of field economists that would support a lead economist in the WO.

2. Functions outside of the WO responsibilities, including a hands on working level to provide the necessary economics inputs to field planning and all forms of economic analysis tasks. This would include economists in the state offices, field offices, and any teams that support specialized types of analysis or service multiple states or ecosystem/ecoregions.

3. The third level for economists would provide technical support for all BLM management efforts. This support would cross all organizational boundaries from the field office through the WO, and would include input from economists in support of all types of management decisions.

There is universal agreement among respondents that economists should be located at the working level of the planning process. They indicate that personnel may be located at these assigned work areas, or be located at other locations and be delegated to perform economics functions at the working level. The concept of shared use of specialists is emphasized as is the idea of having functional teams doing the work. This means having working level economists at the ecoregion, or ecosystem, level where they would actively participate in the planning process by providing the appropriate kind and level of economics inputs so that the economic effects related to each resource category (lands, water, air, minerals, recreation, timber, and wildlife) would be measured and used in the decision making process. This group would use data gathered by the BLM and other sources and also collect local data as warranted. Working level economists are visualized by most respondents as being from the SO with some being placed at the local level when work loads can justify additional economists in district or area offices. Respondents also think that limited economics support for resource management could be provided by the DSC, the WO, a special economics staff, or through contracts.

The SO is identified as the lowest functional level at which adequate work, support facilities, and interaction with the WO and other economists can take place. There is unanimous agreement among the 25 individuals who responded for locating more economists in the state office. Two thirds of the respondents suggest placing more economists at the local level, with the remaining one third expressing an opposing opinion for this organizational structure. Those dissenting appear to be concerned that the work load is not sufficient for a full time economist at this level, given management's philosophy regarding how economic analysis is used in BLM management decisions. In addition, economists at this level tend to lack the interaction and feedback with other economists, and with the state and Washington offices that is necessary to maintain their analytical expertise and their knowledge of the latest and best methodology and technology. However, most respondents do not suggest just one location for economists. Most suggest combinations of locations as the best approach to staffing.

Those responding emphasize that Bureau support is needed for economic activities and related input factors, such as computer systems and data banks, and for the expertise to use these input factors. UC (utilizing contractors, especially universities) is seen as the best source of support for providing these needs. The DSC could provide some technical support; however, there is some doubt that it would provide the full range of support needed. In fact, a number of the respondents are negative on staffing an economics support section at the DSC. This point of view appears to be based on results of past performance of DSC staffs. The concept of developing an economics support staff comparable to the solicitors office is the least well received by the respondents.

Respondents generally feel that the major focus of the WO should be on the national level responsibilities outlined in number 1 above. While the support of respondents for this alternative is generally very favorable, several respondents cautioned against large policy groups that can become detached from the concerns and needs of the field level economists. Developing core groups of field level economists to assist a limited staff in the WO is proposed as an alternative to forming large policy groups in the WO.

In conclusion, the respondents generally are in favor of alternatives that would result in more economists being put in field locations, such as ecoregions and state offices or to a more limited extent in district or area offices, as the means of adding economics capability to the Bureau. Also, the need for an economics staff in the WO has many supporters. Some respondents suggest realigning the existing staff of BLM economists, while others envision a larger number of additional economists. However, many of these respondents also recognize the possible effects that current and expected budgetary restraints could have on staffing, and suggest alternative approaches to the seven options suggested to them in the data inquiry. One of their suggestions includes centralizing specialized functions (like mineral economic evaluation is centralized) in order to gain efficiency, proficiency and reduce costs. Budget implications will be a major force in determining how much can be accomplished in terms of increasing the Bureau's economics capability. The recommendation on the best approach to improve economics capability will be outlined in the last chapter of this report.

MANAGEMENT'S PERSPECTIVE ON THE ROLE OF ECONOMICS

The following comments are the result of information gathered from 20 management people in and around the WO and from various State Directors, Associate State Directors, and Deputy State Directors within the Bureau. Their views provide a sample of management's thinking regarding the role of economists and economics in BLM's natural resource management activities.

COMMENTS

Observations regarding the role of economics/economists are surprisingly consistent and almost unanimous. It is apparent that regional economic analysis, and regional economists, can and need to play a far more important and vital role in ecosystem management. Ecosystem based management dovetails well with the concept of regional economics modeling. In addition, shrinking budgets, competing resource demands, and higher environmental ethics require that the Bureau be sensitive to the health and well-being of the public land and the human environment. Economics is an important facet of the human environment.

None of the individuals contacted believes that the BLM is experiencing any excesses of economic expertise or capability. Also, no one believes that the Bureau is at just the right level of economics/economists, mix of skills, or geographic distribution. All managers agree that it is essential that this arena of skills must be enhanced if the Bureau is to pursue ecosystem management. A large percentage of those commenting also expressed almost the equivalent opinions about social sciences in general.

In addition to the virtual unanimity of all interviewed regarding the above, there was only slightly less agreement regarding the following sequence of events. There was a flush of support for the use of economists after Federal Land Policy Management Act (FLPMA). The emphasis was on broad areas of planning and associated NEPA work. However, like many elements of that initial surge, the bloom faded and there are only a few scattered elements of remaining active and sustained use of economists and economics. Managers and economists both agree on this history of events.

The following conclusions can be drawn from past use of economists by the Bureau.

1. The organizational placement of economists is critical in structuring the economics program. It will not work if there are just a few scattered groups of economists here and there throughout the organization. A "team" in WO or DSC will not work either, by itself. Without integration and ownership of the economics function by management, the initial enthusiasm or commitment to this will wane.

2. Management, with rare exception, has never learned how to use any of the social sciences in the regular conduct of most of the Bureau's business. This strongly suggests that there is no purely organizational action, such as committing FTEs, hiring, and then placing economists (or other social sciences) in any particular organizational configuration that will work. It is becoming a somewhat hackneyed observation, but in this instance also there must be a culture change.

Reference to training managers in the use of these skills is often made. In today's vernacular this usually is in the context of putting together ecosystem management teams, in which this additional element (economics) is just another component of the new training for new skills that will be a requisite for Bureau and management success.

3. The flip side of 2 above is that economists and other social scientists themselves are apparently never to become managers. Indeed, if BLM really wanted to they could find enough social scientists to fill quite a number of management positions. Perhaps that needs to be addressed as an alternative way to produce managers with social science know-how.

4. The Bureau's cultural diversity initiative is also related to both 2 and 3 above. Simply stated, there has been some difficulty with recruitment in the Bureau's traditional skill areas. It is quite likely that the Bureau could be considerably more successful in the hiring, retention, and promotion of capable women and minority social scientists in the non-traditional areas of the social sciences. However, there has not been a lack of available social scientists in the past for the Bureau to hire. The low profile of social scientists in the Bureau has been a matter of Bureau policy -- it has not regarded them or their contributions with much esteem.

BLM's Use of Economists

There is also considerable agreement among those interviewed in management on what to use economists for in BLM. As noted above, the first reference was almost always to ecosystem management. Every possible use thereafter was then mentioned. The most commonly expressed concept regarding an ecosystem was that it is just another characterization of a region, requiring the expertise of regional economists, and all that they do. Other functions mentioned as tasks for economists are:

1. Modeling;
2. Projections;
3. Activity specific analysis such as minerals, forestry, range, etc.; and
4. Emerging issues/special assignments.

There were also references to the concept of Integrated Enviro/Economic Accounting. There is likely to be significant support for trying this in at least a few pilot areas. Those areas already targeted as ecosystem pilots would seem a logical choice.

Some of those interviewed acknowledged that some of what economists are now doing will likely continue without change. The prime example given was minerals related economic analysis. Fair market value appraisals, royalty reduction work, mineral reports, drainage calculations, trespass evaluations, etc., will all need to continue. In this regard there were a few comments on the location of the Northwest Regional Evaluation Team (NRET) that performs this type of mineral valuation. One position favored placing it at DSC and beefing it up to be better able to handle a larger workload. The opposite view stated that it would likely soon die of neglect at DSC and could only be viable under the supervision of a state director with a major minerals program. However, as stated earlier, the DSC's new Director is expected to breath new life and purpose into the Center. Therefore, it is premature to make any judgements on its future standing within the Bureau.

There were also comments about the lack of a career path for economists. The idea is not just to have economists, but to have recognized economists. This implies senior as well as junior economists. This does not appear possible at the present time, because there is currently no way for economists to be promoted through the ranks as economists. No one seems to argue this point.

The Future Use of Economists by BLM

The following statements summarize some thoughts supplied by management on how to relate the issue of the future use of economists with what else is happening in the Bureau and elsewhere.

1. An assessment of scarce skills and their present status in BLM is needed. This is listed as being a Field Committee assignment under Larry Hamilton and is the next stage of the Futuring product produced under Bill Lamb. The logic is that futuring indicates what tasks the Bureau is going to face. Scarce skills addresses whether the BLM has the capability to accomplish them.

2. Washington Office reorganization, DSC reorganization/review, and a limited but potentially growing list of SO Ecosystem pilot organizations all have potential impacts on the use of economists. On the one hand, the outcome of these proposals will condition some of the options for the placement and use of economics. On the other hand, these recommendations could impact those deliberations.

3. Vice President Gore's National Performance Review and related matters of performance measurement as an element of reinventing government may also have implications on the use of economics. It is clear throughout all of those documents that there will be need for economics input.

4. The President's Council on Sustainable Development is another example. Initial materials reveal a clear and substantial role for economics.

While not truly needed, the last two initiatives discussed above provide additional support for any argument that the BLM must enhance its economics capability if it is to be a meaningful player in reinventing government and determining what will need to be done.

A work plan for the Presidents Council on Sustainable Development provides the following informative statement, "Taken together, these make up many of the components of a sustainable community. One can look at each component in isolation, but it is through the integration of economic, social, and environmental concerns that sustainability is going to be achieved." This statement is reinforced in the BLM's 94 Preliminary Annual Work Plan, where under the Director's Directives it reads:

> "** Help local communities anticipate and adjust to changing social, economic, and resource conditions.
>
> + Develop staff capability in regional economics.
> + Support rural development initiatives."

There are other quotations that can be found in the Ecosystem management concept paper and in some of the state proposals for implementing ecosystem management. Idaho, in particular, is replete with references to the need to include economic and social factors.

The reasons for referencing these quotations is because they all make it clear that economics will be included. That is not a matter of debate. It is reassuring that virtually everyone talked to throughout BLM is in agreement. The challenge is to show some evidence of it in implementation.

COMMENTS PROVIDED BY STATE OFFICES

As part of an attempt to ascertain management's views on economics and economists within the Bureau, State Directors and various other top level managers in each state were asked to respond with any comments they might have for improving the integration of economics into the Bureau's decision making process. The following are comments received from management in some of the BLM state offices:

California

States such as California are faced with increasing population and land use conflicts. Rural counties in particular are under severe economic pressures. For instance, the impact of land acquisition by BLM on the tax base and employment can be of paramount concern to local governments. Economists could play an important role in determining the level and significance of these impacts on the State and communities.

The ecosystem approach to resource management brings BLM in direct contact with a wide variety of economic issues. For instance, development activities have been traditionally directed more to private lands while public lands have been more often used for resource protection. This may or may not be the best use of land under the ecosystem management concept. Economics can help to determine this. California has 10 coordinated management plans in progress that need economics input. This represents quite an economics work load.

If it is going to succeed at ecosystem management, the BLM must be able to balance biological components of ecosystems with the economics components. Specific functions that California thinks economists could provide for them include:

a. Assisting in preparing regional ecosystem plans such as West Mojave,

b. Conducting economic analysis on major EIS's such as Viceroy and Hayden Hill,

c. Addressing economic issues involved in national initiatives such as Grazing Reform and Mining Reform,

d. Working with counterparts in other federal agencies on economics studies associated with multi-agency efforts (Pacfish and Femat),

e. Working with counterparts in state or local agencies on economic sections of joint CEQA/NEPA documents,

f. Providing quality control over contracted economics studies,

g. Maintaining economics data bases, and

h. Monitoring economic trends affecting BLM lands.

Colorado

If BLM's current emphasis on ecosystem management is to fully incorporate an evaluation of the role human demands and uses play in an ecosystem, a model would have to be developed that would define the role of humans in the ecosystem and the way that ecosystem evaluation would incorporate social and economics information. This model would also have to explain how social and economic analyses would influence public land management decisions. Economic and social considerations should be required elements in ecosystem management and this fact should be communicated throughout the BLM.

Idaho

In relation to ecosystem-based management, our objective is to manage geographic areas having an interrelated set of resource values in a manner that balances the commercial with the intrinsic. Our intention is to look at interrelationships, mutual benefits, and the diverse economic aspects of resources throughout an ecosystem.

Ecosystem management lends itself well to regional economics modeling. Idaho has an ongoing effort to establish a sub-regional input/output economic base model for Lemhi and Custer Counties of Idaho, where the BLM's Salmon District is located. This model is being developed in cooperation with the local government entities, the local Forest Service Office, and the University of Idaho. This concept has potential to utilize the skills, knowledge, and resources of many concerned groups in a dynamic process of data gathering, analysis, and review. To integrate diverse groups in data collection and analysis allows them ownership in the process and a means to develop a dialogue concerning allocating resources.

New Mexico

With the future of ecosystem management facing us, with more questions coming from the public on economic considerations (especially county governments), with more NEPA EIS's under consideration at the district level, with future revisions of Resource Management Plans (RMP's) having more emphasis on economics, the future demand for economists and their skills will only be increasing. The work load demand will be from both the district offices and resource areas. So, locate economists first at the state office level and then at the district office/resource area levels, depending upon the need. With the existing limitation on FTE's, an alternative for BLM might be to rely on its ecosystem management "partners" to provide economics and other scarce skills through Memorandums of Understanding (MOU's) or less formal mechanisms. Another option would be to utilize on call contracts. In isolated shortages of economics skills the option of being able to call on other BLM offices for assistance should always be available.

Utah

A better definition is needed to describe the role of BLM economists. Also, more networking among BLM economists is important to preserve and reinforce their role throughout the agency.

There is always a concern about the interface between traditional economics and the valuation of subjective attributes (such as open space, environmental quality, natural conditions, visual quality, and certain recreational activities). Also, Utah notes concern for western rural income versus regional and national values. As BLM moves toward ecosystem management, these aspects are becoming more important in its decision process. The BLM needs to be in a better position to articulate these things, support them with creditable data and analysis, and document and use the information in the decision process.

CONCLUSION

In conclusion, the utilization of economics/economists in BLM can not be accomplished via the creation of a few core groups of specialists at a limited number of locations throughout the nation. Conversely, the opposite will not work either. The Bureau cannot afford to scatter economists throughout the Agency, locating them in the Washington Office, Denver Service Center, Phoenix Training Center, and state offices, district offices, and area offices. Indeed, if the BLM is not going to reallocate FTEs there are only marginal changes that can be made. These include:

1. A Washington Office senior economist to serve as a network coordinator, standard bearer, and perhaps to assure certain quality bench-marks are met. This individual would also serve as advisor to the Headquarters Management Team on economics matters.

2. An exhaustive survey and identification of all economists, past and present, for the purpose of more precisely understanding the Bureau's true capability with respect to a cross-section of economics specialties and skills.

3. Development of a comprehensive plan for the use of the social sciences in ecosystem management.

4. Development of the Network per number 1 above, which would most likely consist of staff at each state office and additional staff only at selected district offices and area offices. There is little support for much additional capacity at the Denver Service Center. It is also assumed that Washington Office staffs would include social scientists.

However, the bottom line is that in the short-term there is little likelihood that BLM will take dramatic and disruptive steps to increase the numbers of social scientists (economists and sociologists) employed in the near term. Thus, significantly changing the use of those already employed will be very important. Through a sustained effort and with sustained leadership the quantity and quality of input from the social sciences into BLM decisions and implementation can be substantially enhanced. The key will be a small network of leaders in the Washington Office and state offices (or ecoregions), who with the sustained support of senior management, can transfer this element of BLM to a highly visible and valuable part of its future.

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ECOSYSTEM/ECOREGION MANAGEMENT

ECOSYSTEM MANAGEMENT: PURPOSE AND PRINCIPLES

As presented in the Director's memorandum of October 8, 1993, entitled Ecosystem Management in the BLM: From Concept to Commitment (attached), ecosystem management includes numerous planning and management processes which are intended to reduce conflicts from the competition between consumptive use and non-consumptive use of public lands and resources and to implement and maintain "integrated enviro/economic accounting (IE/EA). The fundamental purpose of ecosystem management is to promote scientific and ecologically (or environmentally) sound management of lands and resources in order to achieve and maintain the ecological sustainability, productivity, diversity, and integrity of the public lands. The major objective of IE/EA is to not only accomplish all of these goals but to also maintain (and if possible improve) the sustainability, productivity, diversity, and integrity of the economic and social environments that are influenced by the various BLM managed ecosystems. The key elements determining the success of these concepts are cooperation and coordination among land owners, land managers, and other interest groups to achieve mutually beneficial environmental, economic, and social goals. In other words, succeeding at ecosystem management and IE/EA will require a sincere team effort among all interested parties and throughout the entire ecosystem management process.

The ecosystem management and IE/EA concepts are based upon several principles:

1. Sustainability - Managing public lands to conserve, maintain, and restore the productivity and diversity of ecological processes and systems while concurrently providing for human values, products, and services within the "limits of ecological sustainability".

2. Scientific Information - Using scientific information, research, new technologies, and the results of monitoring as the bases for resource allocations and other land management decisions.

3. Public Involvement - Involving the public in the planning process in a more meaningful and productive manner and coordinating and cooperating with other Federal, state, and private land managers and owners to provide for social and economic well-being while safeguarding ecosystem health.

4. Determining Future Landscape Conditions - Determining future landscape conditions and establishing mutually agreeable land and resource goals and objectives based on historic, ecologic, economic and social considerations.

5. Minimizing Impacts - Conducting resource use activities in the ecosystems in a manner that minimizes degradation of the area's ecological, economic, and social environment in order to maintain ecosystem health and achieve IE/EA. Recognizing ecosystem management related externalities (beneficial or detrimental) and tracking these to wherever and to whomever they may impact. Controlling these externalities in a manner that would maximize (to the extent possible) both ecosystem health and the public's welfare.

6. Interdisciplinary Approach - Adopting an interdisciplinary approach to land management to promote organizational consistency, cooperation, and coordination in establishing and

accomplishing ecosystem management objectives. Because of the diverse number of variables that are interrelated/interdependent in ecosystems, BLM's ecosystem managers will need to rely heavily on advisory teams composed of specialists who represent all of the ecological, economic, and social aspects inherent to an ecosystem. These teams will need to provide up-front as well as on-going input into all ecosystem management processes. Only by integrating the analyses of these teams of specialists into its management process can the BLM really hope to determine all of the possible impacts and trade-offs involved in a given ecosystem management situation, to deal with any related externalities, and to really achieve IE/EA.

7. Long-term Horizons and Goals - Defining long-term ecological objectives before short-term economic objectives are identified.

8. Managing Landscapes - Reconnecting isolated parts of landscapes to restore ecosystems to a healthy condition.

9. Practicing Adaptive Management - Linking and using the results of BLM's and others' monitoring programs and scientific information to guide resource management direction and decisions.

10. Planning - Planning in close coordination and cooperation with all land owners, land administrators and managers, and other interested parties for management of lands and resources within a defined area in order to achieve common, accepted goals or objectives and, thereby, to optimize the satisfaction and general feeling of well-being of all concerned. This is a departure from the generally unilateral planning BLM and other Federal, state, and local governmental agencies have historically done.

In addition, implementing ecosystem management will require organizational, technical, and operational changes within BLM which will all affect how and where economics and economists can best serve the Bureau.

ORGANIZATIONAL CHANGES

BLM's major programs tend to function independently, each having its own constituency, budget, objectives, priorities, and activities. Historically, economics has only been an aside to this overall management and organizational process. Also, there is a high level of autonomy built into the organization. The following procedures would help to improve not only the opportunities for successful ecosystem management but also the effectiveness of related economics input:

Networking

Consistent, accurate information is essential to economic analyses. This involves sharing of resource information between programs, between organizational units, and with outside entities and collectively "processing" and applying such information to insure effective use and application of that information in making land and resource decisions. It involves extensive internal coordination between Bureau specialists and managers and coordination with other entities, organizations, and persons reviewing, discussing, and analyzing resource management activities and information.

Management by Geographic Area

Ecosystem management requires definitions for administrative or management areas or units using ecological or some other logical criteria. These areas or units will become the focal point for management objectives and actions established and undertaken by and between BLM and other land owners and other interested parties and for related economic analyses. Efforts are now underway to establish uniform, mutually agreeable, ecosystem and ecoregion delineation criteria.

Establishing Common Goals and Objectives

Common ecosystem management objectives that include ecologically oriented goals are needed to replace current resource program oriented objectives as guidance for dealing with specific resource conditions. This will help to achieve integrated enviro/economic accounting (IE/EA) in ecosystem management.

Funding by Geographic Area

Funding by geographic area rather than by resource program or sub-activity will give managers greater flexibility in implementing actions. It will reduce the conflict and competition between programs and program specialists for funding individual sub-activities and can better enable the Bureau's economics function to receive more dependable and dedicated funding.

TECHNICAL CHANGES

The following technical changes will be necessary to support ecosystem management and the application of economics to it:

Collaboration

Establishing formal processes for analyzing available resource information; establishing theories and principles to manage ecosystems and agreeing to management practices consistent with these theories and principles; monitoring results; making adjustments to theories, principles, and practices; and "institutionalizing" what is learned.

Inventory

Ecological Site Inventory (ESI) is being adopted by BLM as a standard inventory technique. It will support ecosystem management by ensuring that inventories are conducted by interdisciplinary teams, that inventory data is consistently and continuously used in making management decisions, and that the data is periodically updated and maintained. This same type of procedure is needed for establishing ecoregion economics inventory data.

Monitoring

Monitoring to find out what management actions and practices work is essential to restoring and/or maintaining biological diversity and ecosystem productivity and in applying economics analyses to the BLM's resource management activities.

Institutionalizing Resource Information

Information collected from monitoring, inventories, and experience must be documented and preserved so it remains part of BLM's institutional knowledge and available for future use in land and resource management decisions. This is equally true for economics information incorporated into resource management decisions.

SERVING THE PUBLIC INTEREST

Ecosystem management considerations must successfully merge the physical and social sciences to gain political and public acceptance. The ability to respond to public concerns at the local level is integral to the concept and success of ecosystem management. Such local concerns have always been triggered by BLM's natural resource management activities, but it is reasonable to expect that such concerns could increase within the atmosphere of ecosystem/ecoregion management. This increase in public concern could result from such things as the possible realignment of management area boundaries, a larger number of entities (both public and private) involved with the planning and management of natural resources in any given ecosystem/ecoregion management area, a wider range of interests to be satisfied because there are more players in the management game, and the larger spectrum of natural resources that will need to be managed to accomplish the Bureau's biodiversity and environmental accounting objectives.

Since the BLM's land management decisions are often controversial and frequently challenged, it is critical that the BLM base its management decisions and responses to local interests on valid, scientifically developed information and rationale. This includes employing sound economic analyses, based on valid data and methodology, that clearly shows the interested local parties how ecosystem/ecoregion management decisions will impact the economic and social well being of each of them. Such sound economic analysis of the various environmental and dollar and cents tradeoffs, resulting from BLM management decisions, can provide added creditability to BLM's management objectives and potential actions and to its responses to public concerns.

The following are some actual examples of public concerns expressed at one of the Bureau's resource management plan (RMP) scoping meetings. These issues demonstrate how public views and interests can differ with regard to resource management objectives for any given resource area.

a. Members of the public attending the meeting desired access to public land for various activities, and expressed the desire to have public land posted.

b. It was suggested that public access be achieved by land exchanges.

c. They wanted private land owner rights maintained.

d. Even though increased access was desired, the public did not want the land abused by too much access. Therefore, limiting the number of people permitted in the area was acceptable to those at the meeting.

e. Those at the meeting also wanted income levels to be maintained or increased, but they didn't want the land character or use changed.

f. The public wanted special areas protected but their views on how to do this differed.

g. They wanted riparian areas maintained in a healthy condition.

h. Some people wanted to maintain old growth timber and provide cover/habitat for various wildlife species. Others wanted timber provided for use by the local economy.

i. There were those who advocated managing the natural resources in the area for the long-term and for all of the public rather than for a few private interests.

Ecosystem/ecoregion management will require that such concerns and controversies be resolved in some manner so that all interested parties can agree to and develop a feeling of ownership for the management plan objectives established for a given area. This means actively involving people, their views, values, and needs in a management process which fosters cooperation and coordination in land and resource use decisions. Some actions which might encourage this involvement include:

Forming Cooperative Relationships

Cooperative relationships are arrangements wherein all parties have both something to contribute and something to gain from the relationship. In terms of managing natural resources and landscapes, these contributions and benefits are often difficult to identify. The problem is further complicated by traditional values and systems. Economic benefits in relationship to public land management have typically been viewed in narrow, dollar terms and have been based on short-term thinking. Formation of cooperative relationships will be necessary to identify overall regional economic productivity and other goals and objectives necessary for creating and sustaining healthy, productive natural systems.

To realize cooperative relationships in ecosystem management, the common interests among various land and resource managers and users must be identified. This cooperative processes will need to be implemented with an understanding of resource condition and the ability of the resource to support the uses and amenities we want or need.

In addition, attaining common ecosystem management goals and objectives requires the commitment of all affected parties. To gain such commitment, there has to be something "in it" for everyone. BLM must involve all interested parties and the public in ecosystem management planning not only at its inception but throughout the process and also demonstrate to these interested parties that there is something in it for all of them. Economics can help to provide such information to the public.

ECONOMIC IMPLICATIONS OF ECOSYSTEM MANAGEMENT

The principles of ecosystem management defined in the Director's "concept paper" have direct economic implications. For example, the "input-output" analysis models used by economists have direct and useful application for analysis of ecosystems because they can record the interactions among economic sectors and related resource inputs at various geographical levels. They are most commonly used for analysis of economics impacts at the regional, state, and national levels. This corresponds to the larger areas of management consideration that are likely to be necessary under the ecosystem/ecoregion management concept.

Because the Bureau's "ecosystem management concept" recognizes economic objectives and activities along with ecological/biological objectives/activities, the economist's input into the environmental accounting equation provides a measure of the economics portion of the economics versus ecological/biological tradeoffs possibilities.

Following are some examples of benefits that economics input can provide the Bureau relative to its ecosystem management efforts. These examples are intended to be illustrative and are not all encompassing. The intent of this investigation was to identify the economics capability of the Bureau, but not define how economics will be utilized in all aspects of ecosystem management. As the ecosystem approach to management is more closely defined a complete list of economics functions to be included in an ecosystem based approach to management needs to be clearly described and documented in Bureau manuals and handbooks.

1. Improve BLM management actions by including economics as a consideration in the decision process.

2. Reduce the costs of litigation by helping to supply verifiable and justifiable input to BLM's management decisions and actions.

3. Improve the credibility of BLM management objectives and actions in the eyes of the public, especially at the local level, and thereby help to achieve public cooperation for BLM programs.

4. Provide management with valid benefit/cost and related tradeoff information that shows what/who benefits from management actions, as well as the level and distribution of related costs. This will enable management to make more educated, knowledgeable decisions when deciding how to allocate resources (especially scarce resources) between various uses.

5. By showing management the most economical way to manage public resources, economists help the taxpayers get more return for their management dollars. For example, economists can

help with budgeting and allocating funds among Bureau organizational units and projects, and in setting program priorities and emphasis.

STAFFING OF ECONOMISTS UNDER ECOSYSTEM MANAGEMENT

The first step in integrating economic considerations into an ecosystem based approach to management is to staff each ecoregion with sufficient economic expertise to perform all required economic analyses and directly support on-the-ground management decision making. These economists would work at the ecoregion level as members of interdisciplinary teams that would be composed of biological and physical resource specialists, as well as economists and other social scientists. The ultimate staffing and skill requirements for ecosystem/ecoregion management are dependent on the decisions for the configuration of the objective ecosystems and ecoregions. However at the present time, no final decisions have been formulated as to the number of ecosystems or ecoregions required for this new approach to management. Therefore, some simplifying assumptions concerning the number of ecoregions are required in order to determine the number of economists that will be needed to staff interdisciplinary teams for the implementation of an ecosystem approach to management.

There are 12 western states where BLM manages significant amounts of public lands and for the purpose of this analysis the assumption is made that there will be at least 3 corresponding ecoregions per statewide area, even if state boundaries no longer apply. This results in 36 ecosystems/ecoregions that BLM could staff with economists. Since BLM has relatively few interests in Texas, Oklahoma, Kansas, Nebraska, South Dakota, and North Dakota, these areas probably would be combined with other BLM ecoregions; therefore, the assumption is made that these areas will not have their own economists. Similarly, the lands and minerals managed by the Eastern States Office are somewhat scattered and are not expected to form an ecoregion.

Several of the respondents to the data collection instrument expressed concern over placing additional economists at field office locations. This concern was based on the theory that there was insufficient work at field office locations to fully occupy an economist. However, under the proposed ecosystem/ecoregion approach to resource management, the land area included in an ecoregion will likely be much larger than the current resource areas, which would expand the work load of an economist placed in a field location. In addition, each economist will be a member of an interdisciplinary team that will support virtually all actions related to ecosystem management, including planning, resource assessment, and environmental assessment. This will substantially increase the work load for an economist at the ecoregion level. In fact, as economists become more fully involved in all facets of ecosystem management, it may be necessary to have more than one economist in some ecoregions.

By law, field level economic evaluations must be performed for all minerals that will be leased, sold or exchanged to ensure the receipt of fair market value for these minerals. This function is currently performed at the regional level and cuts across many ecosystems/ecoregions. It is not envisioned as a function of the interdisciplinary ecosystem teams, because in 1983 and 1984 the Linowes Commission was formed to conduct a thorough investigation of the mineral economic evaluation function and this congressional inquiry confirmed that consolidation of this function into centralized teams was the most effective and efficient mechanism for estimating mineral values.

This mineral economic evaluation function currently provides a full work load for about five BLM economists. Added to the 36 resource/regional economists required for staffing the proposed ecoregion teams, this results in a Base Level requirement of 41 economists in field locations to support the BLM's total on-the-ground economic analysis work load (see Table 3). This is considered the base staffing requirement that would be needed to support an ecosystem/ecoregion approach to management. This base staffing level is applicable regardless of whether the ecoregions are established according to hydrologic boundaries or via other system delineations, such as those of Bailey (USFS). The most notable shortfall of this staffing level and of placing all of the Bureau's economists at the field level is the lack of economics support for the Bureau's Director.

TABLE 3 -- ALTERNATIVE LEVELS OF ECONOMICS SUPPORT

Staffing Alternative	Ecoregion/ Mineral Eval. Economists1/	Washington Office Economists2/	State Office Economist Support3/	Economists on State Director Staff4/	DSC / PTC Economists5/	Administrative Office Economists6/	Total Economists
Base level	41						41
Phase 1 Expansion	41	3					44
Phase 2 Expansion	41	3	12				56
Phase 3 Expansion	41	3	12	12			68
Phase 4 Expansion	41	3	12	12	6		74
Phase 5 Expansion	41	3	12	12	6	13	87
Phase 6 Expansion7/	77	3	12	12	6	13	123

1/ Includes one economist in each ecoregion and three ecoregions in the 12 western states (Washington is included as a separate state). Requires five economists to support the mineral fair market value determination function.
2/ Three senior economists in Washington (one lead and two support).
3/ One additional senior economist in each of the existing 12 state offices (Washington State is administered by Oregon) to support ecoregion economists.
4/ A senior economist is assigned to the state director staff in each of the 12 existing state offices.
5/ Three economists located in the Denver Service Center and three in the Phoenix Training Center.
6/ One economist would be placed in the Division of Administration in each of the existing 12 state offices and the Washington Office to work in budgeting, procurement, contracting, and other financial areas as budget analysts, program analysts, etc.
7/ This expansion includes doubling the economics capability at the ecoregion level by adding 36 more economists.

Several additional staffing alternatives have been proposed to correct this shortfall and also to more fully incorporate the economics program into the Bureau from both the perspective of analytical support and management decision making. These alternatives are presented in Table 3, and each successive expansion in the staffing level has an associated impact on the budget and FTE availability by committing successively higher increments of each to support improvement of the economics capability of the Bureau. On the positive side, committing additional resources to expanding the Bureau's economics capability will help to ensure that management decisions are supported by integrated enviro/economic accounting.

Phase 1 Expansion

Under the proposed Phase 1 Expansion three senior economists would be placed in the Washington Office to support the Director, respond to congressional inquiries, provide budget support, coordinate policy formulation and help ensure management has adequate economics support at all levels within the Washington Office. One plausible configuration would be to have a lead economist and two support economists. The skill mix for these economists should include all economics specialties that are represented in the field, plus any other specialized economics skills which may be needed but lacking in the field. Under this proposal a total of 44 economists would be needed throughout the BLM and support would be provided directly to management at both the field and Headquarters locations.

Phase 2 Expansion

If sufficient funding is available to increase economics capability above the Base Level and Phase 1, then the next priority should be to add resource and regional economists at the state office level. These positions could conduct specialized research on issues such as non-market values that will directly support field offices, provide coordination with universities, administer contracts for services that would support the ecoregion economists, act as backup support for the ecoregions during times when the ecoregion economist positions are vacant or unable to complete all work assignments, and provide review of the work that is being performed at field locations by less experienced economists. Twelve additional economists would be required to implement the Phase 2 Expansion proposal--one in each state office (assuming Oregon and Washington continue management from the same office) and one economist in the Eastern States Office. Phase 2 implementation results in a total of 56 economists needed throughout the Bureau. One way to accomplish this Phase 2 objective would be to fill future job vacancies at the SO level with economists rather than with traditional specialists.

Phase 3 Expansion

Under the alternative levels of economics support for the Phase 2 Expansion and below (Base Level or Base Level with the Phase 1 Expansion), all economics capability will be primarily dedicated to performing the required analyses to support the ecosystem approach to management, with little time available to directly support mid-level management in the Bureau. In order to more fully integrate economics into all facets of the Bureau decision making process additional economists should be placed on the state directors immediate staff to ensure that economics is being incorporated into all management decisions. This position would supply input into management decisions that are based on the analyses performed by field level economists, evaluate tradeoffs between ecosystems and provide budgetary analysis that would help allocate funding among ecosystems. This position could perform a key role for ensuring that adequate enviro/economic accounting is being conducted and all benefits and costs, both within and outside the Bureau, are adequately addressed. The Phase 3 Expansion alternative would require 68 economists throughout the BLM, which includes one economist on each of the State Director's staffs.

Phase 4 Expansion

The Phase 4 Expansion alternative would add three economists at the Denver Service Center and three at the Phoenix Training Center. These economists could be used for special projects, to perform research studies and investigations, and to provide training to other field level economists. A total of six new economists would be needed under this alternative, which would raise the required number of economists positions for the Bureau to 74.

The economist staffs in the DSC and PTC locations may present an opportunity for introducing entry level economists into the Bureau. While economists at the ecosystem or state office level would be expected to work independently, the economists in the Denver Service Center or Phoenix Training Center could be structured in a team setting that would provide the opportunity for obtaining on the job experience. For instance, new economists could be hired at the GS-7/9 grade, more experienced economists may be employed at the GS-11/12 grade level, and senior economists at these locations may classify at the GS-13/14 grade level. The ultimate grades of these positions would be dependent on the actual duties and responsibilities of the positions. Hiring entry level economists at these locations should also enable the BLM to offer more equal employment opportunities for the incoming work force. In addition, a career path would result that would extend from these entry level positions not only up through the DSC and PTC staffs but also up through the ecoregions, state offices, and the Washington Office.

Phase 5 Expansion

The Phase 5 Expansion alternative would provide for intensive use of economists in nearly every aspect of the Bureau. This alternative would add an additional 13 economists to the Bureau's administrative functions with one such economist in each of the 12 existing state offices and one in the WO Headquarter's Office. These economists would provide economic expertise that could be incorporated into budgeting, procurement, contracting, and any other financial areas where Bureau funds are being expended to ensure that the optimum benefit is realized from these expenditures. Implementation of this alternative would result in the need for 87 economists throughout the Bureau.

Phase 6 Expansion

All of the expansion alternatives have provided additional economists in new organizational locations and functions, but the need for adding more economists at the local/ecosystem level has not been addressed. In the Phase 6 Expansion an additional 36 economists are added at the ecosystem level. The rationale for adding these economists is to better analyze the impacts at the local level. For instance, externalities resulting from BLM actions and the actions of other land managers is an area that could be analyzed by these additional Bureau economists. However, the limited resources currently available to BLM to expand its economics capability makes Phase 6 a most unlikely scenario in the short-run.

Although all 36 of the additional economists added under Phase 6 have been attached to the ecoregions in Table 3, another option would be to stationed some of these at SO's or the DSC or PTC and detail them to the ecoregions as needed. Under the Phase 6 Expansion, both the breath and depth of economic analysis could be extended. This expansion would result in the need for 123 economists throughout the Bureau.

Conclusion

Table 3 summarizes six possible alternatives for incorporating additional economic expertise into Bureau functions. The added benefits from each successive expansion must be weighed by management against the costs of positions foregone in other areas. However, in order to successfully implement ecosystem management, at least the base level of staffing economists (1 in all ecoregions and 5 in the mineral economic evaluation function) must be met, and this staffing level would not provide any immediate economics support to the Director.

Table 3 v.s. Appendix E Scenarios 1-3

Appendix E provides a brief analysis of the existing economics capability of the BLM as compared to staffing requirements at a recommended level of 44 economists. Each of the three scenarios in Appendix E are constrained by specific assumptions. Based upon these limiting assumptions, the Appendix E scenarios show net shortfalls of economists needed to acquire a recommended level of 44 economists. Under these scenarios a total of 11 to 22 new economists would be needed to meet the Bureau's minimum base line requirements for ecosystem management. However, to more fully integrate economics into all aspects of Bureau operations, more economist positions would be required, as shown in Table 3. The FTE requirements for increased economics support above the Phase 1 Expansion level shown in Table 3 would be additive to the current range of 11 to 22 new economists required to support the recommended level of staffing (44 economist positions) under ecosystem management.

OTHER ISSUES AND CONCERNS

The members of the team which prepared this report identified some additional issues regarding certain questions that were raised in the course of this project. These issues are presented below and the recommendations for solutions to these issues are presented in the next Section entitled "Recommended Solutions and Areas of Further Study".

ECONOMICS DATA REQUIREMENTS

There is a question of how economists will deal with ecosystems or ecoregions that are not composed of one homogenous economics region throughout, or where such systems or regions cross over state lines. There is also the question of how economists will deal with economics regions that intersect more than one ecosystem or ecoregion.

Economists can meet these challenges by utilizing not only state and county data but also sub-county data in the analysis process. Acquiring data below the county level will require field level inquiries and surveys either by BLM or entities contracted by BLM. Universities are prime entities for the job of gathering this primary data. One area which is particularly lacking in economics data is the recreation sector. Much more study is needed in this sector to determine consumer needs, desires, expenditures, and values for the resources and products involved (required and expended) for recreational activities. If this is not done, the importance of recreation as a sector within a given ecoregion or ecosystem relative to other sectors/enterprises can not be truly determined. Therefore, providing resources for recreation may not be given as high a priority by those managing natural resources as are some other uses of these resources. In this case, the true tradeoffs would not be known by management.

Another requirement for dealing with economics regions that cross over more than one ecosystem/ecoregion, or ecosystems/ecoregions that involve more than one state is the availability of better methods for measuring economic sector interactions within and among these areas. In these instances where there is such interaction among systems and regions, activities in one area of the ecosystem/ecoregion may well create economics impacts that reach far beyond the point of the action, even as far as another ecosystem/ecoregion or to another state. Thus, relative economic analyses must consider benefits and costs and related tradeoffs wherever and to whomever they occur.

Meeting these challenges will also require cooperation among the various entities involved with natural resource management in any given ecosystem/ecoregion area in order to share technology, data, and methodology among specialists, including economists. If an ecosystem or ecoregion crosses state lines and BLM wants to manage it as a unit, there will have to be agreement among the state entities involved in the unit's management regarding their objectives for the area. There will also need to be consistency in the way data is designated and collected, and in the methodology used to analyze it throughout the region being considered. To combine or compare data from one part of the area with that of another part for the sake of impact analysis requires that the data be truly additive and/or comparable. Only then can tradeoffs between potential alternative management actions be truly representative and comparable.

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BUDGET FOR THE ECONOMICS FUNCTIONS

The BLM needs to make specific provisions within its budget to cover the economics portion of its management efforts to ensure that these costs are covered in a continuous and efficient manner. Budget obligations for this effort need to be in the form of either a separate budget item, or tied to continuing management functions by economics-specific allocations. Traditionally, the economics function has had to rely on other subactivities for funding, which has been particularly problematic in times of declining budgets. As a result, the economics function has not had consistent funding to maintain staff, collect adequate data and fund the development of economics models.

RETENTION OF ECONOMISTS

To stem the current tendency for economists to leave the profession to obtain a higher grade and status in the Bureau, BLM will need to develop some program/criteria that allows economists to advance above the GS-12 level while remaining within their profession. This is an area that needs additional study and consideration by the Bureau.

The criteria used to measure the level of performance that would qualify a given economist for a higher grade classification could be based upon the criteria currently used to determine GS-0110 grade levels. In effect, these include:

a. The scope of the assignments normally handled by the economist.

b. The number and degree of technical complexities that must be dealt with in the economist's specific position and assignments. This includes such things as the degree of creativity and imagination required; the number of relationships and variables involved; and the adequacy of data, methodology and techniques that are available to do the job.

c. The degree of technical responsibility required by the position. This factor covers the degree to which the incumbent of a position is held accountable for various functions inherent to the position.

d. Administrative responsibility of the position. This relates to the extent of the incumbent's responsibility for the allocation of agency resources for various functions and activities related to the position.

e. The degree of policy responsibility. This factor covers the extent to which advice and consultation of the economist may affect government action relative to the nation's economy, population, budget, defense, foreign relations, and other such matters.

Moving an economist to the GS-13 and GS-14 positions would seem to be based on the increasing scope (either the breadth or depth) of the assignments which the economist must complete. In other words, the larger and more varied the operation in which the economist is employed the more eligible the economist is for the GS-13 and GS-14 classification. However, more study is needed by the Bureau to determine the job elements required for non-Washington based economists to obtain grades above the GS-12 level. The potential for increased grades would certainly help to provide an incentive for economists to remain in this profession and continue employment with the BLM. There may also be other incentives that can be applied to help retain a viable staff of economists and these areas should be considered further to support the economics function in the Bureau.

RESEARCH FOR ECONOMICS PROGRAMS

There are several areas that need to have additional research to help perform various types of economic analyses. The Economic Data Requirements Section presented a number of areas that would be well suited for additional research. For instance, disaggregating economics data below the county level or to alternate boundaries that conform to a specific ecosystem. Furthermore, additional investigations into methodologies for estimating the values of non-consumptive resource use such as wilderness, recreation, wildlife or scenic viewing, etc. are also needed to quantify economics values for use in benefit/cost or tradeoff analyses that will be a major focus when managing under the ecosystem concept. Without the benefit of this additional research, not all economics values can be adequately quantified in order to preform a balanced economic analysis of all resources.

While the Bureau would be the primary beneficiary of the research, universities and other foundations such as the National Academy of Sciences may be interested in providing joint funding and/or support for some of these investigations. In addition, other land managing agencies such as the Forest Service, Bureau of Reclamation, Corps of Engineers and state agencies may also be interested in participating in these research efforts. Funding these investigations would help to promote a positive and cooperative working relationship with these other agencies as well.

The total concept and the implications of integrated enviro/economic accounting as well as the control and/or beneficial use of externalities that are potential to ecosystem management are subjects needing extensive investigation. The two subjects are interrelated and with each there is the potential for economic, physical/biological, and social impacts that must be understood and valued. To accomplish this will require teams composed of specialists from each of these disciplines to evaluate potential impacts and trade-offs that could result from BLM's proposed ecosystem management activities and to, subsequently, advise managers of these impacts and trade-offs. Currently, there are many unknowns associated with trying to analyze such impacts and trade-offs. For example, reliable units of measure for evaluating all of the impacts and trade-offs that could be involved in each of these areas have not been developed. In fact, a reliable means of detecting and tracking all of the potential impacts and trade-offs to whomever and wherever they occur has not been established. Therefore, there is the need for a substantial amount of research relative to these subjects, which provides the BLM with a good opportunity to cooperate with other government entities and with the academic community to arrive at some answers.

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RECOMMENDED SOLUTIONS AND AREAS OF FURTHER STUDY

This section of the report will address concerns presented in the former sections of this report and will recommend possible actions that the BLM could take to resolve these concerns and increase its economics capability and effectively apply this capability to its program reforms and ecosystem management efforts. The following paragraphs of the report will also discuss the sequence in which these concerns should be addressed and the possible time frames in which BLM should act to resolve them.

INTEGRATING ECONOMICS INTO BLM PROGRAMS

Both management and the economists in the BLM who were contacted relative to this report favor integrating economics fully into all BLM programs. They are especially aware of the importance of economics as an input to ecosystem management and offered various suggestions on how BLM might realize this integration of economics input into ecosystem management. The following three sections describe actions that the Bureau could take to achieve this integration.

Manuals and Handbooks

The Bureau has a series of manuals and handbooks already written for the various programs and resources such as planning, wildlife management, range management, watershed management, forestry, minerals, etc. that provide the guidance to operate these various programs. These manuals and handbooks will need to be updated and supplemented as a part of the new ecosystem management program. This would be an opportune time to fully incorporate economics into each of these various manuals and handbooks and, subsequently, into each of these respective programs and the administration of selected Bureau functions. For instance, range, wildlife or recreation improvements should be subject to benefit cost analysis to determine where the best return on investment can be obtained. This is particularly important, if funding is to be allocated in block amounts to specific ecosystems. It is imperative that the monies are spent in the areas that result in the greatest public/ecosystem benefits.

This effort to update, revise, and supplement existing guidance and interweave economics into all BLM programs is also an excellent opportunity to allow the academic community and the public to more fully participate in the Bureau's management process. A task force could be set up with Bureau economics personnel and contracted economics professionals from universities and the National Academy of Sciences to develop the new BLM guidance manuals for each of these programs.

Management Training

Several of those contacted in the course of preparing this report also suggested that managers receive training in the science of economics so that they might better understand the benefits of applying it to their management practices. Certainly, existing management personnel will want to take advantage of training in ecosystem principles and management, and the application of economics could be added to the ecosystem training. In addition, if the manual and handbook updates described above are completed prior to any management training on ecosystems, an overview of those procedural changes could be a part of the training. This could also allow the academic community to participate in the presentation of the management training, which might build rapport between this community and BLM managers. The Phoenix Training Center should be one of the BLM facilities used to provide management training in economics as it relates to ecosystem management.

Hire Economists into Management Positions

This is a long term recommendation to increase the Bureau's understanding and use of economics by including economics training/skills in the minimum qualification standards for managers. This action would improve the interdisciplinary capabilities of managers and allow economists to more effectively compete for new management positions. This would ultimately reduce the need for management training in economics and allow economic considerations to play a more important role in the BLM decision making process. This recommendation is consistent with those views expressed by management as a mechanism for increasing the economics capability of the Bureau (see the Section Management's Perspective on the Role of Economics).

Priority and Implementation

The above three recommendations should be assigned a high priority. The Bureau should establish a task force of BLM senior managers and economists to implement these recommendations, and should begin contacting universities and the National Academy of Sciences to find economics professors specializing in natural resources, wildlife, recreation, etc. that are willing to participate in the effort to update Bureau guidance. The updated guidance materials should be completed prior to structuring final interdisciplinary teams in specific ecosystems. Training for existing managers on economics principles and practices to be applied to ecosystem management should be organized and implemented as soon as a usable draft of the guidance manuals and handbooks discussed above can be completed. The third of the above recommendations (the hiring of economists into appropriate management positions) should be an ongoing effort.

ORGANIZATION AND STAFFING

Those contacted generally agree that there are not enough economists at the level of BLM management where plans and decisions are being made. Economics input into these plans and decisions, when realized, is often too little and too late to provide management with a true picture of the economic implications of their decisions and actions. Benefit/cost, efficiency, and/or input/output analyses are not being performed as a standard procedure to help management determine the economic tradeoffs resulting from the allocation and/or utilization of public resources. Management is not now, and has not been, well informed regarding how these economics tools can be used to provide economics criteria that will benefit the decision making process.

Those questioned generally were in favor of alternatives that would result in more economists being placed in field locations, such as state offices (or to a more limited extent in district or area offices) as the best method for adding economics capability to the Bureau. In addition, the need for an economics staff in the WO was also recognized, but concern was expressed that this Office not be staffed at the expense of placing economists in field locations. Some of the responses also referred to realignment of the BLM's existing staff of economists. These opinions on organization and staffing have prompted the following primary recommendation for BLM's organization and staffing. Establish a Senior Economics Advisor position attached to the Director in Washington. Also provide expertise at the State Office level with a lead economist supporting each State at a significantly high level of expertise. The primary emphasis for the placement of economics capability, however, would be at the field/working level, where an economist/sociologist would be placed on an interdisciplinary team to address ecosystem management concerns. However, there are opportunities for activities such as computer modeling, development, and testing work that could be conducted at other locations like the Denver Service Center.

To the extent possible, within FTE and budgetary limits, every effort should be made to hire more economists to serve on interdisciplinary teams in ecosystems or ecoregions (i.e. at the local level). Table 3 and Appendix E provide rough estimates of the number of economists that would be required to staff ecoregions throughout the Bureau. Since the effort to structure ecosystems is still in the early stages, it is not possible to develop firm estimates of the number of economists that would be needed throughout the Bureau. However, based on the assumptions used in Appendix E and Table 3 approximately 44 economists would be needed to provide the BLM minimum economics support (the 36 on ecoregion interdisciplinary teams, the 5 economists employed in the mineral economic evaluation function, and the 3 Washington Office staff economists). The WO staff would include a Senior Advisory Economist Position attached to the Director and two other staff economists. Using the scenarios presented in Appendix E, this effort may require an additional 11 to 22 economists to fully staff all ecoregions with economists.

These estimates of staffing requirements can be more clearly defined as specific ecosystems/ecoregions are established and the resources in each one are more fully quantified. There may be possibilities for a single economist or field level team of economists to respond to the work load for multiple ecosystems. In addition, the procedures developed in the revised guidance material discussed earlier may reveal efficiencies for specific programs such as recreation that can be handled through teams of economists much like the mineral economic evaluation teams are used to determine fair market values for solid minerals. The centralization of some of the specialized economic analysis functions may be appropriate to gain proficiency and ensure consistency across the Bureau. The staffing of economists within specific ecoregions should not change the regional concept for mineral economic evaluation that is used to meet the fair market value mandate from the Federal Coal Leasing Amendment Act and other minerals related legislation.

This organizational issue should be given high priority, but the timing for implementation must be tailored within budgetary constraints. In addition, the timing can also be structured around the establishment of ecosystems within the various geographic locations, which may help temper the budgetary demands for hiring large numbers of employees over a short period of time. Priority should be given to filling the three senior positions in the Washington Office with economists that are most qualified for the positions. The next highest priority should be assigned to filling the economist position on all interdisciplinary ecoregion teams as these teams are being assembled. Some of these positions could be filled by the reassignment of existing personnel, to the extent practical, but filling the balance of the positions would require recruiting new economists from outside the Bureau. Within budgetary constraints, the next priority should be assigned to filling the senior and supporting economist positions on the state office staffs (see Table 3, Phase 2 Expansion). If possible, additional economists should be added through the

Phase 2 Expansion level presented in Table 3 by the time the ecosystem management process is fully operational. All subsequent expansion of the BLM's economics staff (as outlined in Table 3) could be based on management's priorities and available funding.

BUDGET FOR THE ECONOMICS FUNCTION

The Section on Ecosystem/Ecoregion Management - Definitions and Concepts presented a discussion of the traditional Bureau programs and competition among programs for budget allocations. The economics function has never been a part of this process because all money for the economics function is supplied by other subactivities. As a result, the economics function must always be dependent on other programs for funding and suffers the most when funding is tight in other programs. Without a specific funding allocation, the economics function in the Bureau will always be impacted by any wide budget fluctuations, possibly resulting in the loss of personnel, lack of funding for data collection, inability to develop and maintain economics models and loss of cooperation from other agencies and institutions who have initiated economics studies with the BLM, only to find that the Bureau is unable to contribute its share of support on an ongoing basis.

In order to avoid these circumstances in the future, independent funding for economics support activities is highly recommended on an interim basis until funding is provided on an ecosystem basis for the interdisciplinary teams. Several respondents suggested getting a separate budget allocation through Congress, but this effort probably would not be fruitful based on similar initiatives tried in the past. A more easily administered funding allocation could be achieved through a flat surcharge on all programs that require or are supported by economic analyses. A flat rate to all programs applied at the national level would be the most fair to all supporting subactivities by not making any one subactivity pay a disproportionate share of economics support. However, such funding would increase and decrease along with similar changes in the funding in each of these activities, but it would not result in the economics function of BLM operations always being the first function to suffer in times of reduced funding.

This recommendation should receive a high priority and be implemented at the beginning of the 1995 fiscal year. The manual and handbook updates and supplements discussed earlier should help in determining which programs will be supported by the economics function and subsequently can be charged for that support, but some additional study will be required to determine the applicable rate to be applied to these programs. This should be completed prior to the beginning of the 1995 fiscal year. The allocation of the economics funds will need to be based on the type of work to be completed in each of the ecosystems under study, but a high priority should be placed on hiring the additional economists to staff the economist positions on the interdisciplinary teams in each ecoregion.

CAREER PATHS FOR ECONOMISTS

Figure 4 in the Current Bureau Economic Expertise Section shows that there is no real career path for economists. This fact was also confirmed by the responses submitted by Bureau economists and reiterated by management officials in their interviews. At the present time there are no entry level economists in the Bureau. In fact, less than 15 percent of those individuals responding to the data collection effort are in grades GS 11 or lower. The vast majority of all remaining economists in the Bureau are topped out at the GS 12 grade level. The only options for advancement beyond this point is to wait for one of three economist positions in the Washington Office to become vacant or, at the field level, to move into other specialties outside of economics that offer promotion potential, or to attempt to move into management roles that are not traditionally filled by economists. In order to re-establish a career path within the BLM for economists the following recommendations are offered:

1. Reevaluate the duties and responsibilities of the field level economists in light of the new ecosystem approach to management and the potentially broader scope of participating in resource decisions that will result from incorporation of economics into all Bureau management functions. A sincere classification effort that is in tune with the Bureau's indicated spirit of government "reform" would undoubtedly result in field level grades through at least the GS 13 or 14 level, especially given the career structure presented in Table 3.

2. In situations where teams of economists are established, consider creating group leader, or chief, positions that would offer additional career advancement for existing economists.

3. Where journeymen level economists are not required, consider hiring entry level economists or using coop students from colleges and universities to begin a career with the Bureau. This will provide a new group of economists that can fill the higher level vacancies as existing economists retire or receive promotions.

4. Consider establishing higher graded senior technical specialist and senior economists positions, as well as agency liaison or training positions at state offices, the Denver Service Center, the Phoenix Training Center, or in the Washington Office. This will provide career opportunities for those economists who choose this type of work.

5. Expand the eligibility requirements for managers to include economics skills. This will allow economists that are so inclined to compete for line management positions.

Recommendation items 1 through 3 should receive high priority and be implemented as a part of the new ecosystem approach to management. Classification actions should occur as the interdisciplinary teams are being structured in each ecosystem. The priority of items 4 and 5 are intermediate term and should be accomplished as organizational changes permit.

RETENTION OF ECONOMISTS

The problem of having an adequate career path for economists has been discussed and recommendations have been provided to help enhance career opportunities for BLM economists, but a more immediate problem is the retention of the economics staff that is presently on board in the Bureau. The information provided by the respondents shows that 9 of the 30 respondents, or about 30 percent, have already moved out of economics for career advancement opportunities in other areas. The problem that remains in the short term is to retain the existing economists in the Bureau. In order to meet this objective, the following recommendations are supplied:

1. More closely evaluate the duties and responsibilities of the existing economists. A sincere classification effort would undoubtedly result in field level grades through at least the GS-14 level.

2. Providing strong support for the economics program through increased funding, enhanced awareness of the importance of economics by management, and more opportunities to see that economics is truly relied upon and used to support management decisions will greatly help the morale of BLM economists by showing them that their work does make a difference.

3. Where applicable, continuing education or education scholarships could be offered to enhance the knowledge and skills of existing economists to better meet Bureau needs.

4. Exchange programs could be offered to economists or resources specialists located at universities, or in state and local governments [as provided for in the Intergovernmental Personal Act] or in other federal agencies [such as the Forest Service, Fish and Wildlife Service, Park Service, Bureau of Mines, or Office of Surface Mining]. Such exchanges would help BLM economists to advance their skills through new job experiences and to receive information on new (or improved) technology and methodology and related application techniques.

Recommendations 1 and 2 should be given high priority. Implementation of the first recommendation can begin in the immediate future by carefully instructing personnel offices to proceed with classification and evaluation of existing economist positions in light of the new responsibilities under ecosystem management. Recommendation number 2 will occur as economics is more fully incorporated into the ecosystem approach to management, but management must make a conscious effort to use economics in all decision making processes where it is applicable. Recommendations 3 and 4 are assigned a moderate priority and should be implemented as situations arise where these career advancement opportunities are shown to be beneficial to both the employee and the BLM. However, an effort must be made to let the existing economists know these programs are available.

ECONOMICS DATA NEEDS

Sound economic analysis and applying the most appropriate analytical techniques depends heavily on the availability and accuracy of data. The problem of acquiring adequate data to support economic analysis has always been difficult to overcome. However, the complexity of this problem will be increased by having ecosystems that don't necessarily conform to state, county, local or other standard boundaries that define the areas for which data are generally collected. Detailed data are essential under ecosystem/ecoregion management to enable the economist to consistently and accurately value all benefits and costs of BLM actions so that all resources involved in tradeoff situations are justly and equitably represented. The following recommendations are provided to help support the economics function by ensuring the receipt of quality data.

1. Provide funding for cooperative agreements or contracts with Universities to collect primary economics data or disaggregate secondary data that has already been collected.

2. Initiate data sharing agreements or memorandums of understanding with other Federal, state or private agencies to acquire additional data.

3. Work with the solicitors office to develop regulations and procedures that will allow BLM to acquire and provide adequate safeguards for confidential data received from other agencies.

4. Develop standard survey instruments that are OMB approved for collections of data such as recreation use and willingness to pay values that can be used by BLM field offices or contractors.

5. Coordinate the conversion of the current ADP equipment to the target system so adequate provisions are made to receive data that is collected and analyzed by universities, other agencies and contractors. Ensure system design is open-ended to allow incoming data to be received in a variety of alternative formats.

Recommendation number 1 should be given a high priority to support ongoing efforts and new planning that will be a part of ecosystem management. Funds should be made available through the Fiscal Year 1995 annual work plan. Recommendation 2 should be assigned a moderate priority and be supported by the local field office economics staff in coordination with the Washington Office staff as the need arises (ongoing basis). Completion of recommendation 3 is a high priority because it is currently preventing financial data that would greatly enhance the mineral economic evaluation function from being received from state governments. Recommendation 4 should be assigned a moderate priority that can be achieved through a joint effort of BLM, universities and independent consultants that have previously performed this type of investigation. Field office economists should identify all current and potential data bases that BLM now has access to, or will be using in the immediate future, so that the Washington Office IRM staff can ensure these resources can be readily accessed through the target ADP system. This recommendation should also be assigned a high priority.

INTEGRATED ENVIRO/ECONOMIC ACCOUNTING

Consider structuring a system of integrated enviro/economic accounting within the Bureau that could be used to present the enviro/economic tradeoffs resulting from ecosystem management decisions to both managers and the public. This balance sheet approach to management would help to show all concerned parties that losses in some areas can be offset by gains in other areas. This is especially important when comparing the impacts from alternative approaches to resource management. Economics could play a vital role in this process by helping to determine and quantify the various resource credits and debits into a common unit (the dollar) for all resources.

RESEARCH FOR ECONOMICS PROGRAMS

To the extent practical, funding should be provided to support economics research through universities and private research firms. As mentioned in the Other Issues and Concerns Section, research is needed to improve methodologies for determining economics values for such activities as recreation, wildlife viewing that engage in the non-consumptive use of resources and where market values are unavailable but required to adequately quantify and qualify the resources for benefit/cost, tradeoff and other types of economic analyses. This recommendation should be assigned a high priority and completed as funding permits or specific needs arise.

Before BLM can establish the system of integrated enviro/economic accounting discussed above, extensive research is required to define the system and establish standards for its application Bureau-wide. The related subject of externalities also needs extensive study. Research is needed relative to both concepts in order to establish reliable units of measure for detecting, evaluating, and tracking related impacts and

trade-offs. This effort should be assigned a high priority to ensure that a workable IE/EA system can be in place along with the full implementation of an ecosystem based approach to management.

APPENDIX A

DATA COLLECTION INSTRUMENT

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240

OCT 04 1993

In Reply Refer To:
3000 (WO-600/WY-910)

Memorandum

To: BMT Members: State Directors, Director-NIFC, Service Center Director, AD-Land and Renewable Resources, AD-Energy and Mineral Resources, AD-Support Service, and AD-Management Services

From: Deputy Director

Subject: Economics Capability of the BLM

As the Bureau looks at ways of reinventing processes and improving efficiencies, we would like to improve the integration of economics into our decision-making. I have asked the Wyoming State Office (Bill Eikenberry) in cooperation with the Washington Office (Adam "Dan" Sokoloski) and the Denver Service Center (Larry Bembry) to assess our existing capability and offer suggestions that would enhance economics capability in the BLM. This would provide an environment where economists could play a key role in solving natural resource management problems with a special emphasis on environmental accounting under ecosystem management.

In an effort to identify the Bureau's existing economics capability, we will be asking all BLM employees in the 0110 series to answer the questions presented on the attached inquiry and to return their answers to Bill Eikenberry, WY-910 by October 15, 1993. Some of these same individuals will be contacted by phone to clarify answers they provided in their initial response to this inquiry.

To better understand management's position regarding the role of economics in the Bureau, I am also requesting you to provide your suggestions on how to best use economists in our ecosystem based approach to resource management. These comments should also be provided to Bill Eikenberry by October 15, 1993.

QUESTIONS DIRECTED TO BLM SERIES 0110 ECONOMISTS

PURPOSE OF THESE QUESTIONS:

TO DETERMINE BLM'S CURRENT ECONOMIC CAPABILITIES AND POTENTIAL WAYS TO STRENGTHEN THE ECONOMICS COMPONENT OF BLM'S ECOSYSTEM MANAGEMENT PLANNING AND OPERATIONS.

BACKGROUND AND PROCEDURES:

These questions have been prepared and distributed in response to a request from the Director's Office. It provides BLM economists with an opportunity to supply top management with information on BLM's current economic capabilities and to suggest methods for enhancing these economic capabilities relative to management planning and operations.

In your response to these questions, reference the number of the question that corresponds to your answer. It is not necessary to repeat the question on your answer sheets.

For question 4, relate your choices of the alternatives to relative budget and FTE requirements. In other words, estimate how many dollars and people would be required to do what you suggest.

If you have questions regarding any facet of this inquiry, please contact either Bill Eikenberry, WY 910, at (307) 775-6001, or Adam (Dan) Sokoloski, WO-600, at (202) 208-4201. Fax your completed responses by October 15, 1993, to Bill Eikenberry at the WSO fax number (307) 775-6003. Your cooperation in this endeavor is greatly appreciated.

Questions to be addressed

1. To determine what economic expertise BLM now has
   A. Provide a short statement on your educational background and job experience, indicating which type of economic specialties you possess.

   B. In what economic specialist category(ies) would you place yourself? Some examples of categories would be micro, macro, quantitative, natural resource, public utility, agricultural economists, etc.

   C. What analytical tools are you currently using in fulfilling your BLM assignments/duties? Some examples of analytical tools would include benefit/cost, input/output, accounting, trends, regression, etc.

2. Current use of BLM economic expertise
   A. How is your economic expertise currently being used relative to BLM activities?

B. How applicable is your expertise to BLM's ecosystem management activities?

C. What types of economic analyses are currently being performed by you in your present position, and in what context? For example, do the analyses relate to existing programs such as range, timber, minerals, and/or recreation. Do they relate to regional and/or ecosystem management? Other?

3. In your opinion, what are the current and anticipated future needs of BLM for economic expertise, keeping in mind the implications of changing world affairs and NEPA trends on BLM management responsibilities and actions? Further keep in mind that the current emphasis on ecosystem management will require that the complex, diverse, and often conflicting demands/uses of natural resources be met by BLM management in a manner that is environmentally sound for both humans and other species. It also requires that more economic analyses be performed on the qualitative aspects of resource values. Some areas of need to consider:

A. Organization?
B. Personnel?
C. Technology and equipment?
D. Other?

4. What is your opinion of the following possible alternative ways for BLM to acquire needed economic expertise and to fully integrate this expertise and relevant economic analyses into management's decision making process for ecosystem management?

A. Hire more economists at the local level.
B. Hire more economists at the state office level.
C. Establish a small staff of senior economists at the Denver Service Center to advise and assist field offices and attend top level management meetings where they could supply economic input as needed.
D. Establish a small staff of senior economists at the Washington Office to aid field offices and to attend top level management meetings where they could supply economics input as needed.
E. Contract out to universities and other entities to develop the economic tools and provide the input needed for BLM resource management decisions.
F. Establish an economic staff within the BLM that would provide economic review and council to managers in basically the same manner as the solicitor's office now provides legal counseling and guidance on resource management issues.
G. Some combination of the above.
H. Other than the above.

APPENDIX B

OTHER BLM PERSONNEL WITH ECONOMIC EXPERTISE

Respondents and reviewers identified the following additional Bureau personnel as having a background in economics. Due to the tight time frame of this study, it was not possible to secure their responses to the data collection instrument. However, these people do represent an additional source of economic expertise for the Bureau. There were three individuals that did not respond to the data collection request and they are also included in this Table. All of these employees should be included in any future studies of economics capability or applications to ecosystem/ecoregion management.

STATE	NAME/POSITION	SERIES	GRADE	PHONE
AK	Bill Caulkins Associate State Director	GS-0340	15	907-271-5080
CA	George DaBai Chief, ML&SM	GS-1301	14	916-978-4735
DSC	Carla Naujock Cooperative Education Student	NA	5	303-236-7000
ID	Bill McNally Outdoor Recreation Planner	GS-0023	11	208-678-5514
MT	Wendy Favinger Economist	GS-0110	11	406-255-2836
MT	Bob Lawton State Director	SES		406-255-2904
NM	Keith Bennet	GS-1171	12	505-438-7400
OR	Judy Nelson District Manager	GS-0340	14	503-683-6600
WO	Dan Dick	GS-0301	14	202-452-0340
WO	Gene Kolkman	GS-0340	13	202-653-6753
WO	Jane Yeager Senior Advisor-Economics	NA	15	202-208-7701
WO	Jeff Zabler Special Assistant to Deputy Director	GS-0301	15	202-208-5443

NA: Indicates the data were unavailable at the time this report was completed.

APPENDIX C

DETAILED RESPONSES TO ALTERNATIVES FOR INCREASED ECONOMIC EXPERTISE

Table C–1
RECOMMENDED LOCATIONS FOR ECOSYSTEM/ECOREGION ECONOMICS STAFF

Employee	Number of Responses	At Local Level		At State Office		At Service Center		At Washington Office		Use Univers. & Contr.		Create an Economics Staff		Some Combination		Other Suggestions		
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
ALLEN, ROY L.	4	1				1		1						1				
BAYS, DALE E.	7	1		1			1	1			1		1	1				
BORKOSKI, JAMES F.	1			1														
BRODERICK, JOHN W.	8		1	1		1		1		1			1	1		1		Bureau–wide communication sys.
CABE, LOREN	0																	
EIKENBERRY, BILL	4	1		1				1						1				
FITZPATRICK, KEN. T.	7		1	1		1		1		1		1		1				
FRASIER, STAN	6	1		1			1	1		1			1					
GEEHAN, PATRICK H.	3	1		1												1		IPA, exchange with State Govmt.
HUGHES, EDWARD L.	6	1		1		1		1						1		1		Phoenix Training Center
LEUDERS, AMY	6	1		1			1	1		1			1					
MACKALLOR, JULES A.	8		1	1			1	1		1		1		1		1		DOI Staff, under Asst. Secretary
MARTIN, JOHN V.	7	1		1		1		1		1			1	1				
MARTINSON, FRED. K.	2									1		1						
MILTON, ROBERT T.	7		1	1		1		1		1			1	1				
MOORE, STEVE	7		1	1			1	1		1			1	1				
MYERS, PAUL E.	7		1	1		1		1		1		1		1				
NIELSON, ROBERT M.	7	1		1		1		1		1			1	1				
PEDERSON, JOHN A.	7	1		1		1		1		1			1	1				
PINDELL, DARLA D.	3	1		1				1										
PRANZO, JEANETTE A.	6		1	1		1		1		1			1					
ROMANIELLO, CHARLES G.	4	1		1		1		1										
RUNYON, LESLIE F.	3	1		1				1										
SANTMYER, CARL L.	6	1		1		1		1		1				1				
SOKOLOSKI, DAN	5	1		1		1		1		1								
SU, TEDDY S.	2							1		1								
THOMPSON, JOHN	7		1	1		1		1		1		1		1				
TOPPING, CLYDE P.	6	1		1			1	1		1			1					
WILLIAMS, JEFF T.	5		1				1		1	1						1		Socioeconomic Council
YOUNG, JOHN	4	1		1				1		1								
TOTAL	155	17	9	25	0	14	7	25	1	20	1	5	11	15	0	5	0	
Positive	126	17		25		14		25		20		5		15		5		
Negative	29		9		0		7		1		1		11		0		0	
No Response	85		4		5		9		4		9		14		15		25	

KEY
QUESTION POSED

NUMBER OF RESPONSES = Of eight categories, number for which a positive or negative response was recorded.
LOCAL LEVEL = Hire more economists at the local level.
STATE OFFICE = Hire more economists at the state office level.
SERVICE CENTER = Establish a small staff of senior economists at the Denver Service Center to advise and assist field offices and attend top management meetings where they could supply economics input as needed.
WASHINGTON OFFICE = Establish a small staff of senior economists at the Washington Office to aid field offices and attend top management meetings where they could supply economics input as needed.
UNIVERS. & CONTR. = Contract out to universities and other entities to develop the economics tools and provide the input needed for BLM resource management decisions.
ECONOMICS STAFF = Establish an economics staff within the BLM that would provide economics review and council to managers in basically the same manner as the solicitor's office now provides legal counseling and guidance on resource management issues.
COMBINATION = Any combination of the above.
OTHER = Other than the above.

APPENDIX D

CONCEPT PAPER FOR BLM'S ECOSYSTEM MANAGEMENT INITIATIVE

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

October 8, 1993

In Reply Refer To:
1736 (200)

EMS TRANSMISSION 10/12/93
Instruction Memorandum No. 94 - 14
Expires 9/30/94

To: All AD's, SD's, and SCD

From: Director

Subject: Ecosystem Management in the BLM: From Concept to Commitment

I am transmitting the attached document, Ecosystem Management in the BLM: From Concept to Commitment for your review. This revised version of an earlier "concept paper" outlines the principles of ecosystem management and makes clear the Bureau's commitment to restoring and maintaining ecologically sustainable ecosystems.

Please forward your responses to Chris Wood or Kniffy Hamilton at WO-200 by Tuesday, October 19, 1993.

Signed	Authenticated
Denise Meridith	Dawn Slaughter
Deputy Director	Directives,WO873

1 Attachment
  1 - Ecosystem Management in the BLM: From Concept to Commitment (10 pp.)

Director's Preface

Dear Colleagues:

Secretary of the Interior Bruce Babbitt has spoken of the need to develop a "new American land ethic" that is both ecologically responsible and socially responsive. The Bureau of Land Management (BLM), with stewardship responsibilities for over 270 million acres of public lands and vast subsurface mineral estates, can play a substantial role in developing and implementing such a new land ethic.

The land management principles contained within this document, *Ecosystem Management in the BLM: From Concept to Commitment* provide a new management philosophy and a fundamental change in management of the public lands and their resources. As Director of the BLM, I intend to make certain that the principles of ecosystem management frame management of the public lands. Time has come for us to work with nature, rather than against it, for the long-term benefit of society.

The public's expectations and use of federal lands grow daily. It is the challenge of the BLM to implement management that meets these expectations within the limits imposed by the need to conserve biological diversity and safeguard ecological sustainability.

The BLM is not alone in our efforts to develop and implement an ecological approach to management of the federal lands. We are working closely with other state and federal land management agencies, Congress, user and public interest groups, and private citizens to further develop, refine, and implement the BLM's ecosystem management strategy.

Please send me your thoughts on the principles described below. I welcome your input on how to best develop and implement ecosystem management. The implementation of ecosystem management is not a static process. It is imperative that our publics are kept informed and involved every step of the way. I hope you will join our efforts to restore and maintain healthy and productive public lands.

Jim Baca

ECOSYSTEM MANAGEMENT IN THE BLM: FROM CONCEPT TO COMMITMENT

INTRODUCING A NEW VISION

BLM management actions will restore and maintain the ecological sustainability, productivity, diversity, and integrity of the public lands.

INTRODUCTION

The U.S. Department of Interior Bureau of Land Management (BLM) has adopted the principles of ecosystem management to guide its management of the public's lands and resources. The purpose of this paper is to define those principles, explain why the BLM is adopting an ecosystem approach to management, demonstrate how ecosystem management differs from present management, and discuss the opportunities and challenges brought on by the BLM's new management philosophy.

What is Ecosystem Management?

Ecosystem management recognizes that natural systems must be sustained in order to meet the social and economic needs of future generations.

Ecosystem management is the integration of ecological, economic, and social principles to manage biological systems in a manner that safeguards long-term ecological sustainability. The primary goal of ecosystem management is to develop management strategies that maintain and restore the ecological integrity, productivity and biological diversity of public lands. Among other things, sustainable ecosystems provide habitat for fish and wildlife; clean drinking water for communities; and economic and recreational opportunities. Implementing management strategies that protect the integrity and diversity of ecosystems helps to ensure that present and future generations will continue to derive economic, recreational, aesthetic, social, and cultural benefits from the land.

Why is an Ecosystem Approach to Management of the Public Lands Necessary?

Managing for healthy ecosystems conserves biological diversity and allows for sustainable development.

The cumulative effects of past management activities on public and private lands have often led to increased sedimentation in streams; less productive rangeland conditions; fragmented plant, animal, and fish habitats; and forest health problems. Population growth, increased use, and other factors, have also contributed to degradation of the public lands and caused significant declines in the range and numbers of many native flora and fauna. Nonetheless, public lands are the last refuges for many vanishing species.

For example, over 191 federally listed threatened and endangered plant and animal species and over 1,100 candidate species occur on BLM lands. BLM lands provide habitat for at least 109 salmon and steelhead stocks that are threatened with extinction. Furthermore, infestation of exotic, noxious weeds threatens the productivity of the western rangeland and the viability of many native plant communities. About 8 million acres of BLM land are infested by noxious weeds which spread at about 14 percent per year. In other words, approximately 2,000-3,000 acres of productive BLM lands are lost to noxious weeds per day.

Ecosystem management safeguards ecological integrity and provides economic opportunities.

Communities whose economies depend on public lands are often the most seriously affected by ecological degradation. The declining timber and fishing industries of the Pacific Northwest, for example, demonstrate the economic repercussions and social displacement that can accompany ecosystem degradation. Conservation efforts on public lands can make a critical difference to the viability of vulnerable plant and animal species and the stability of local economies. Unfortunately, poor forest and rangeland health, degraded riparian areas, and inferior aquatic habitats often threaten species' viability, resource productivity, and ultimately, the overall sustainability of ecological systems.

How is Ecosystem Management Different From Current Management?

Traditionally, the BLM's resource management strategies have emphasized commodity production and the market value of natural resources. Management objectives developed through the National Environmental Policy Act and land management planning processes were generally designed to expedite the development, extraction, and/or production of resources on public lands. Other uses and values such as wildlife and fish habitats, some recreational activities, cultural, scenic, and aesthetic resources were often viewed as mitigation for more intensive uses. Single uses of the land often were in competition with other uses for domination of the landscape. Management strategies that emphasize the commodity value of natural resources tend to separate BLM programs along functional lines. The lack of internal coordination detracts from the agency's ability to develop coherent and integrated management strategies among other federal land management agencies, private landowners, and other interested parties.

Ecosystem management will assist the BLM in coordinating efforts to identify and achieve the desired future condition of public lands at multiple geographic levels, such as local, regional, and landscape scales. Ecosystems do not have absolute or permanent boundaries. They change and evolve in response to both human influence and natural events. Because ecological systems do not always correspond to existing administrative boundaries, the BLM will share management responsibilities with varied public and private interests including other land managers and other interested parties.

Ecosystem management will not eliminate the necessity for making tough choices.

The application of ecosystem management principles to public lands will not eliminate the need to make difficult resource allocation decisions. Ecological factors impose explicit limits on land use. The BLM will make management decisions with a clear understanding of the relationship between land management activities and ecological sustainability. Resources will be allocated within the constraints dictated by maintaining ecosystem health.

Ecosystem management provides a framework in which scientific information will be used to objectively evaluate resource trade-off decisions. Successful implementation of ecosystem management principles hinges on the integration of scientific information with resource management and allocation decisions. BLM will revise existing management strategies that are devised to meet short-term economic objectives with long-term objectives that restore and maintain ecosystem integrity, productivity, and diversity. As new information is made available, management direction will be modified to ensure the BLM achieves desired future resource conditions.

ECOSYSTEM MANAGEMENT PRINCIPLES

Ecosystem management is consistent with the mission of the BLM as described by the Federal Land Policy and Management Act (FLPMA), which includes the following definition of "multiple use."

> ... [H]armonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the environment with consideration being given to the relative values of the resources and not the combination of uses that will give the greatest economic return or the greatest economic output.

The BLM's management actions are governed by the principles described below.

• *Sustain the productivity and diversity of ecological systems.*

The BLM will manage the public lands to sustain viable ecological processes and functions. We will conserve, maintain, and restore the ecological integrity of the land and provide for human values, products, and services within the limits of ecological sustainability.

• *Use the best available scientific information as the cornerstone for resource allocations and other land management decisions*

The BLM will use scientific information, research, new technologies, and the results of monitoring to determine appropriate local, landscape, and regional management strategies. Closer working relationships between researchers and resource managers will be encouraged to better understand the effects of management activities on the land. The BLM will work more closely with other land management agencies, researchers, and universities to develop methodologies and technologies to restore impaired ecosystems.

- *Involve the public in the planning process and coordinate with other federal, state, and private land owners*

Many resource issues require coordination and cooperation among public and private land managers. The BLM will exchange data with land management agencies, researchers, universities, and others to resolve multi-jurisdictional resource issues such as anadromous fish conservation and restoration, migratory bird habitat protection, and air and water quality. Input from all interested and affected parties will be sought to develop management strategies that provide for social and economic well-being while safeguarding ecosystem health.

BLM will cooperate and coordinate with private land holders and assist them with efforts to conserve and restore the health and productivity of the land. However, BLM has no management authority on private lands and will only work with interested land holders. BLM will not decree private land practices.

- *Determine future landscape conditions based on historic, ecologic, economic, and social considerations*

The BLM will coordinate across administrative boundaries to determine the desired future condition of ecosystems. In order to safeguard sustainable ecosystems, ecological, economic, political, and social factors will be considered to determine appropriate resource uses, cost of uses, products, and services on the public lands.

- *Work to minimize impacts on the land*

Traditional land disturbing management activities on the public's lands such as grazing and mining will be conducted in a manner that minimizes degradation and maintains ecosystem health.

- *Adopt an interdisciplinary approach to land management*

Presently, different programs within the BLM are functionally isolated by their own specific areas of interest and expertise. In the future, BLM programs that are currently separate will work together to set priorities and objectives to ensure consistency among different program areas. For example, the range, wildlife and fisheries, forestry, and minerals programs will establish common objectives and management prescriptions for activities within critically important riparian areas. Program advocacy will yield to ecosystem advocacy.

- *Base planning and management on long-term horizons and goals*

The BLM will plan, manage, and monitor over the long-term. Sustaining ecosystems requires that sound, long-term ecological objectives are defined before short-term economic objectives are identified. The BLM will develop measurable, and quantifiable resource condition objectives whenever possible. When appropriate, upward trends and patterns will be used to define resource objectives.

Local management actions influence resource conditions well-beyond adjacent borders. For this reason, the effect of management actions will be considered at the local, regional, and national levels. As responsible resource stewards, the BLM has a special responsibility to protect unique values on public lands that are not provided for by the market, such as biological diversity, cultural, and some recreational values.

- *Reconnect isolated parts of the landscape*

BLM management actions will be based on connecting all parts of the landscape. For example, rivers will be managed in association with floodplains and management activities in upland habitats will be considered for their effects on riparian areas, surface-waters, and ground-waters.

- *Practice adaptive management*

The BLM will practice adaptive management by directly linking the results of monitoring programs to resource management direction. Management prescriptions will be adapted to reflect changing resource conditions; management by other federal, state, and private land owners; and the effect of management activities on ecosystem health. Management direction will be adjusted as necessary to accommodate the dynamic nature of ecological systems.

The BLM will coordinate with other agencies to review and apply appropriate monitoring methodologies and technologies to the public lands. Whenever possible, monitoring efforts will be coordinated across administrative boundaries and conducted in the most ecologically effective manner. Monitoring will ensure that: 1) management direction is implemented, 2) management direction is effective, and 3) management assumptions about resource conditions and their response to treatments remain valid over time.

On-the-ground monitoring and inventory information will be used to assess the effect of management actions on ecosystem health. The results of monitoring will be integrated into management decisions and management will be adapted as resource conditions warrant. Management prescriptions will be adapted to reflect changing ecosystem conditions and to accommodate the effect of management activities on ecosystem health. Monitoring programs will be developed that clearly describe resource threshold levels, which if exceeded will trigger delay, modification, or cancellation of management activities and/or refinement of management direction.

MOVING TOWARDS ECOSYSTEM MANAGEMENT: OPPORTUNITIES IN THE BLM

California Bioregions

In California, the BLM has signed a Memorandum of Understanding with other federal, state, and county partners to develop a coordinated, state-wide biodiversity planning strategy. The effort coordinates the actions of the principal land management agencies under the long-term goal of maintaining economic growth and development while conserving the rich natural heritage of each major bioregion in California.

Bring Back the Natives

The BLM, the USDA Forest Service, and the National Fish and Wildlife Foundation are in the third year of a cooperative aquatic species restoration campaign that emphasizes interagency coordination, watershed management, and improved land use practices to conserve and restore aquatic and riparian habitats on federal lands.

PacFISH

The BLM and the USDA Forest Service merged efforts to begin restoring anadromous salmonid habitats on public lands in March, 1993. The strategy of the BLM and the Forest Service, known as PacFISH, committed the agencies to developing a common strategy that would conserve and restore Pacific salmon and steelhead habitats and associated watersheds in the West including Alaska. PacFISH stresses the integration of sound scientific and research information with on-the-ground management direction. The PacFISH strategy also formed the aquatic and riparian components of the preferred option developed by the Forest Conference.

Forest Conference Activities

On April 2, 1993, President Clinton convened a Forest Conference in Portland, Oregon. The President directed the federal land management agencies to provide him with a socially responsive, scientifically sound, ecologically credible, and legally responsible plan that would address old growth forest issues such as the controversy over protecting the Northern spotted owl in the Pacific Northwest. A multi-disciplined, interagency team developed a series of forest management alternatives for the President's review. The team's key objective was to develop management prescriptions that would safeguard the viability of native species and allow for the production of a sustainable level of goods and services. Included in the management direction are provisions that limit logging in critically important riparian areas until it is proven that riparian management objectives can be met.

Neo-tropical Birds / Partners in Flight

Partners in Flight (PIF) is a coordinated, international effort designed to conserve neo-tropical migratory bird species and associated habitats. PIF establishes national, regional, state, and physiographic province working groups that coordinate monitoring, research, and public education efforts on neo-tropical migratory birds and their habitats. PIF working groups are comprised of federal and state agencies and private organizations that work together to integrate management efforts for migratory birds.

MOVING TOWARDS ECOSYSTEM MANAGEMENT: CHALLENGES FOR THE BLM

Management Incentives

Historically, federal land managers are rewarded for achieving targets based on the production of commodities. Other objectives, especially those that are non-consumptive, such as aesthetic and scenic values and some recreation, are often neglected. Since the production of all goods and services are dependent on ecosystem health, managers' overriding objective should be to maintain ecological sustainability. The agencies should develop management incentives that are based on the present state and future upward trend of resource conditions. Managers' performance will be evaluated to include resource conditions and trends. The reasons for declining resource trends will identified and addressed.

Managers will be provided with training opportunities that are designed to facilitate the implementation of ecosystem management. In the future, interdisciplinary training will be provided to BLM employees with an emphasis on cross-cutting disciplines such as hydrology, geomorphology, and range and aquatic ecology.

Administrative Boundaries

Agency attempts to implement an ecosystem approach to management are complicated by the presence of administrative boundaries that typically do not correspond to ecosystem boundaries. Boundaries for the public lands were primarily delineated to accomplish social and political goals. Ecosystems occur at a variety of scales and federal agencies are rarely the sole managers of large, self-contained ecological systems. The identification of ecologically based boundaries would assist in defining long-term resource condition trends and objectives from a landscape perspective and would greatly enhance the ability of resource managers to predict the effects of management activities on the land.

The Role of other Agencies, Universities, and Researchers

Federal agencies such as the National Biological Survey (NBS), USDA Forest Service Research Stations, and the Environmental Protection Agency (EPA) could assist the land management agencies to integrate administrative boundaries with ecologically based boundaries in order to:

- Identify management units that will facilitate cumulative effects analyses and/or watershed analyses;

- Map the habitats of threatened and endangered species and rare flora and fauna on public lands;

- Identify sustainable commodity production levels within an ecologically based boundary (e.g., timber harvest in a watershed, forage production across a landscape); and

- To assist in implementing threatened and endangered species recovery programs.

The researchers would be well-equipped to review and analyze existing and potential landscape management techniques (e.g., Geographic Information System technology (GIS), Environmental Monitoring and Assessment Program (EMAP), Landscape Ecology Mapping Analysis (LEMA), and GAP Analysis to utilize their full potential in managing the federal lands.

Resource and Data Classification Systems

Coordination among management agencies is impeded by the fact that federal land management agencies often use different resource classification systems. Standardization in the following areas would promote interagency coordination:

- classification of watersheds, rivers and streams
- classification of standing waters
- classification of wetlands, meadows, bogs
- classification of soil types, land forms (e.g., slideprone vs. more stable soils)
- classification of vegetation and riparian areas

The land management agencies use very different computer systems which complicates information sharing. The creation of a land management agency computer network and data base should follow the standardization of data elements and data collection processes. The ability of land management agencies to cross-link resource data and other information is vital to managing diverse systems such as watersheds and vegetation types.

APPENDIX E

ANALYSIS OF ECONOMIST STAFFING NEEDS FOR ECOSYSTEM MANAGEMENT

This Appendix has been prepared to analyze the additional economists that would be needed to staff the 44 economics positions recommended for the Bureau in the Phase 1 Expansion scenario presented in Table 3 of the chapter on Ecosystem/Ecoregion Management-Definitions and Concepts in this report. This chapter presents six alternative levels of staffing that would help meet the objectives for strengthening the Bureau's economics capability.

Although a base staffing level of 41 economists is also presented on Table 3, it would not provide needed support of the Bureau's Director. The base 41 economist level would only provide for one economist on every interdisciplinary ecoregion team throughout the Bureau and an additional five economists to perform legally mandated mineral economic evaluations to determine the fair market value of the BLM mineral resources. Therefore, the minimum staffing recommendation of this report expands the economics capability for the immediate future beyond the 41 base level for economists to 44 by adding 3 economists in the Washington Office.

The analysis in this Appendix compares the recommended minimum staffing requirements of 44 with the availability of economic expertise in the Bureau. This report identifies at least 33 BLM employees who are either currently working as economists or would qualify to work as economists. This includes employees who have transferred into management positions. The exact number of BLM employees with economic expertise is not currently known; therefore, a complete census needs to be taken by BLM of its employees to determine the total number who have economics backgrounds.

AVAILABILITY OF CURRENT BLM ECONOMISTS

Five of the Bureau's economists are on teams carrying out the mineral economic evaluation function that is responsible for determining the fair market value of Federal coal and of other solid minerals, as mandated by law. Therefore, they, or some other economists, would need to carry on these duties, even under ecosystem management. So, they probably would not be available for ecoregion team assignments. This situation reduces the number of BLM economists potentially available for ecoregion assignments positions to 28 from the initial 33. Also, three economists are required to support the Director in the Washington Office, so the number of economists available for placement on ecoregion teams is further reduced to 25. (See Table E-1.) However, some of these 25 economists are no longer functioning in the Bureau as economists and may not wish to return to that profession. In addition, some of these 25 are in higher level management positions and may not want to accept ecoregion team assignments, especially if these positions are at lower grades and status than their current positions. Then, too, some of these economists, for one reason or another, simply may not want to relocate to another geographical area. Insisting that any of these employees accept reassignment might result in the Bureau losing some of its economists to other employers.

THE SCENARIOS

The following are hypothetical scenarios with qualifying assumptions and are meant to provide some basic estimates on additional FTE's required to staff economists on all 36 potential ecoregion teams. As an alternative to hiring these additional economists, BLM might form agreements with other land management agencies in the BLM ecosystem/ecoregion management areas to share their economists -- in effect have interagency management specialist teams.

TABLE E-1

State	Available GS-0110	Other Economists	Total Economists Available	Needed For Ecosystem	Needed For Regional Teams	Needed For Washington Office	Total Needed	Shortfall In Economists
AK	1		1	3			3	2
AZ				3			3	3
CA				3			3	3
CO	2	1	3	3	1		4	1
ES	1	1	2		1		1	-1
ID	1	1	2	3			3	1
MT	2	2	4	3			3	-1
NM				3			3	3
NV	1		1	3			3	2
OR	3	1	4	3			3	-1
SC		1	1					-1
UT	3		3	3			3	
WA				3			3	3
WY	5	1	6	3	3		6	
WO	3	3	6			3	3	-3
Total	22	11	33	36	5	3	44	11

Scenario 1

This scenario is the most optimistic in terms of minimizing the estimated number of additional FTE's and economists that will be needed to staff all 36 teams.

Assumptions:

1. Each of the 25 economists that have been identified as potentially available is mobile and can be relocated from his/her current position/location to a new, permanent position on an ecosystem/ecoregion management team.

2. If any of these economists lacks the economics skills required for ecoregion management team assignment, the BLM will supply training in the needed skills.

3. The FTE's attached to positions that might be vacated by economists that are currently not in GS-0110 positions could be utilized to enable the Bureau to hire more GS-0110 economists.

Results

The number of additional FTE's required under this scenario would, hypothetically, be 11, or the number of estimated ecosystem teams (36) minus the number of potentially available economists (25). Table E-1 summarizes the calculation of these additional personnel requirements by BLM State Office locations. The right most column of this Table, labeled "Shortfall in Economists" presents the number of economists that would be needed in each state. All positive values represent additional needs and negative numbers represent surplus economists that would be available to move to other geographic locations. Based on the assumptions of this scenario, there would be five office locations that would have surplus economists. These locations are the Eastern States Office, Montana, Oregon, the Denver Service Center, and the Washington Office. This results in a total of seven surplus economists that could be moved to other areas. However, there are eight state locations that would need a total of 18 additional economists. This leaves a net shortfall of 11 economists to be acquired by the BLM if it wants to fully staff all 36 of its potential ecoregion teams.

Scenario 2

This scenario is less optimistic that the first because it considers only GS-0110 economists for assignment to ecoregion teams.

Assumptions:

1. Only the GS-0110 economists are really available to staff the ecoregion teams. These Bureau GS-0110 economists total 22, minus the 5 that are staffing the mineral economic evaluation function and 3 in the Washington Office, which leaves 14 available for ecoregion teams.

2. All 1 GS-0110 economists can be relocated to wherever they are needed in the Bureau.

3. If any of these economists lacks the necessary skills for ecoregion management team assignment, the BLM will supply training in the needed skills.

Results

The number of additional FTE's needed under this scenario would be 22 (or 36 potential team positions minus the Bureau's 14 available GS-0110 economists). See Table E-2. This table follows the same format as Table E-1 with the right most column showing the additional economists that would be needed in each state. Under this scenario there would not be any surplus economists to move from existing locations to ecoregion teams.

TABLE E-2

State	Available GS-0110	Needed For Ecosystem	Needed For Regional Teams	Needed For Washington Office	Total Needed	Shortfall In Economists
AK	1	3			3	2
AZ		3			3	3
CA		3			3	3
CO	2	3	1		4	2
ES	1		1		1	
ID	1	3			3	2
MT	2	3			3	1
NM		3			3	3
NV	1	3			3	2
OR	3	3			3	
SC						
UT	3	3			3	
WA		3			3	3
WY	5	3	3		6	1
WO	3			3	3	
Total	22	36	5	3	44	22

Scenario 3

This scenario differs from Scenario 2 by assuming no reassignment flexibility.

Assumptions

1. Only the GS-0110 economists are available to staff the BLM's ecoregion teams, but they are only available in the areas where they are currently employed.

2. As in the above scenarios, the economists assigned to the mineral economic evaluation teams are not assumed to be available for re-assignment.

3. The 3 economists in the WO are not available for reassignment to any of the ecoregion teams.

4. Because of the assumed unavailability of the mineral evaluation and the WO staffs, the total number of economists available for team assignments under this Scenario would be 14, the same as it was under Scenario 2.

5. If any of these economists lacks the necessary skills for an ecosystem management assignment, the BLM will supply training in the needed skills.

Results

The shortfall of economists under this scenario would be 22, or 36 potential team positions minus 14 available economists--just as it was under Scenario 2. See Table E-3. Ten states in this scenario would have less economists than are needed to staff all of the potential ecoregion teams. The other 2 states (Oregon and Utah) each have 3 economists, enough to staff all of their potential teams but none to spare. Therefore, none of the present BLM economists would need to be relocated. In fact, whether the BLM moves its current available economists to fill ecoregion positions or hires additional economists to fill such positions, it will still need 22 more economists than are currently on board to fill all economist positions needed under the minimum staffing recommendation of this report.

Scenario 3 probably most closely reflects what the actual staffing situation would be for BLM if it tried to fill all 36 estimated ecoregion team positions. This scenario, assuming no employees were moved, would have the least amount of disruption to BLM's existing staff of economists and would have little or no costs associated with moving current employees to alternate geographic locations. Of course, in reality, current employees in one location might desire to be relocated to a shortfall position in some other location. While the relocation of current employees is counter to the "in place" assumption in this scenario, allowing economists to relocate might help to retain these economists in the GS-0110 series and in the Bureau.

OTHER CONSIDERATIONS

As indicated by the attached tables, the distribution of GS-0110 economists among the SO's is uneven. Arizona, California, New Mexico, and Washington do not currently have permanent economists while Wyoming has 5; Oregon and Utah 3; Colorado and Montana have 2; and Alaska, Eastern States, Idaho, and Nevada have 1. Since many of the states actually have a short fall in the number of economists needed to staff their anticipated ecosystem/ecoregion teams, few out of state moves would be required of existing economists. Instead, most States would need to employ additional economists, or arrange with other public land management agencies to share their economic expertise/economists, if any, with BLM. The other option to hiring more economists would be for BLM to contract for this expertise. However, without an economist to supervise the quality of the contract output, this answer to the shortfall of personnel is not very practical.

If BLM experiences the expected loss of 5% of the work force to retirement in early 1994 and chooses not to fill a few of the supervisory, managerial, or administrative support vacancies as is also expected, this would leave more than adequate FTE resources to fill the 11 to 22 new economists positions that would be required for ecosystem management under these scenarios. This use of FTE's coincides with the Secretary's initiative to put more of BLM's existing resources on the ground.

TABLE E-3

State	Available GS-0110	Needed For Ecosystem	Needed For Regional Teams	Needed For Washington Office	Total Needed	Shortfall In Economists
AK	1	3			3	2
AZ		3			3	3
CA		3			3	3
CO	2	3	1		4	2
ES	1		1		1	
ID	1	3			3	2
MT	2	3			3	1
NM		3			3	3
NV	1	3			3	2
OR	3	3			3	
SC						
UT	3	3			3	
WA		3			3	3
WY	5	3	3		6	1
WO	3			3	3	
Total	22	36	5	3	44	22

DICTIONARY OF TABLE TERMS

TABLE E-3

State	Available GS-0110	Ranked For Selection	Awaited For Regional Tabled	Awaited For Washington Office	Total Vacant	Shortfall in Economists
AK	1	2			2	2
AZ		3			3	3
CA		3			3	3
CO	2	3	1		6	2
ES	1		1		2	
ID	1	3			5	3
MT	2	3			5	3
NM		3			3	3
NV	1	2			3	2
OR	[illegible]					
SC						
UT	3	3			6	
WA		3			3	3
WY	3	3	2		8	3
WO	3			1	3	
Total	22	38	5	3	63	32

KEY TO ABBREVIATIONS USED ON TABLE 1

1. ADMIN--ADMINISTRATOR
2. AGRI and AG--AGRICULTURAL
3. ANAL--ANALYSIS OR ANALYSES
4. APP OR APPRAS--APPRAISALS
5. APPR--APPRAISER
6. B/C--BENEFIT/COST
7. BR--BRANCH
8. BUDG--BUDGET
9. CHEM--CHEMISTRY
10. COMP--COMPUTER
11. CON. & OPER.EC.MODELS--CONSTRUCTION AND OPERATION OF ECONOMICS MODELS
12. DAD--DEPUTY ASSISTANT DIRECTOR
13. DEM--DEMAND
14. DETER--DETERMINING
15. DIS.CASH FL--DISCOUNTED CASH FLOW
16. DIV--DIVISION
17. EC OR ECON--ECONOMIC(S)
18. EC.AN.--ECONOMIC ANALYSIS
19. ECONOMET--ECONOMETRICS
20. ECOSY--ECOSYSTEM
21. ED--EDUCATION
22. EIS--ENVIRONMENTAL IMPACT STATEMENT
23. EIS:NAT. &REG--ENVIRONMENTAL IMPACT STATEMENT:NATIONAL & REGIONAL
24. ELEC--ELECTRONIC
25. ENG--ENGINEER
26. ENV.MONTRNG--ENVIRONMENTAL MONITORING-DESIGN REQUIREMENTS
27. EST--ESTIMATE(S)
28. EVAL--EVALUATION
29. EXPEND--EXPENDITURES
30. EXP--EXPERIENCE
31. FIANC--FINANCIAL
32. FREQ.DI--FREQUENCY DISTRIBUTION
33. FRM OR FR--FARM
34. GEO.ENG.--GEOLOGICAL ENGINEER
35. I/O--INPUT/OUTPUT MODELS OR ANALYSES
36. INC--INCOME
37. INDUST--INDUSTRIAL
38. IMPLAN--U.S.FOREST SERVICE I/O MODEL
39. IMPLEM--IMPLEMENTATION
40. INSTITU--INSTITUTIONAL
41. INTERNTL--INTERNATIONAL
42. INTERNTL.TR--INTERNATIONAL TRADE
43. LEAS--LEASABLE

44. LN--LAND
45. LN.EXCH--LAND EXCHANGE
46. LP--LINEAR PROGRAMMING
47. MGMNT--MANAGEMENT
48. MIN OR MINS--MINERALS
49. MKT--MARKET
50. MONTE-C--MONTE-CARLO, A RISK ANALYSIS TECHNIQUE
51. MULTIPLIERS--ONE OF THE OUTPUTS DERIVED FROM I/O MODELS
52. NAT--NATURAL
53. OPER--OPERATIONS
54. OR--OREGON
55. OSO--OREGON STATE OFFICE
56. PALEO--PALEONTOLOGY
57. PLAN--PLANNING
58. PNV--PRESENT NET VALUE
59. PROJ--PROJECT
60. PUB.UT.--PUBLIC UTILITY
61. PR--PRICE
62. QUANT--QUANTITATIVE
63. REAL.SP.--REALTY SPECIALIST
64. REC--RECREATION
65. REG--REGRESSION
66. RES--RESOURCES
67. RES.AN-QUANT.TECH--RESEARCH ANALYST-QUANTITATIVE TECHNIQUES
68. RIMS II--COMPUTER PROGRAM
69. R.SOC--RURAL SOCIOLOGY
70. SCI--SCIENCE
71. SIMULAT--SIMULATION
72. SOC--SOCIOLOGY
73. SOCIOEC--SOCIOECONOMIC
74. ST--STATE
75. STAT--STATISTICS
76. STAT.ANAL--STATISTICAL ANALYSIS
77. ST.CERT.GEN.APPR--STATE CERTIFIED GENERAL APPRAISER
78. STDS--STANDARDS
79. SVIM--A COMPUTER PROGRAM
80. TECH--TECHNIQUES
81. TH--THEORY
82. VAL--VALUE
83. WASH--WASHINGTON
84. WELF--WELFARE
85. WLDLF--WILDLIFE
86. WTRES--WATER RESOURCES
87. WTSHD--WATERSHED

X=YES
O=NO

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